

THE  
**VETERINARY BULLETIN**

Vol. 28]

November, 1958

[No. 11

## DISEASES CAUSED BY BACTERIA AND FUNGI

ANON. (1958). **Penicillin-resistant staphylococci in milk.** — *Brit. med. J.* April 5th, 822-823. 3470

An annotation. Penicillin-resistant staphylococci are now found frequently and the extensive use of penicillin for the treatment of bovine mastitis has contributed to the modification of these organisms. Gould (1957) [*Nature, Lond.* 180, 282] found that the nasal flora of workers in a factory which handles penicillin had staphylococci which were without exception resistant, the majority being of phage-group III. Tee (1957) [*V.B.* 27, 3162] reported that in herd milk samples in Dorset penicillin-resistant strains were isolated from 11 of 120 samples in 1954 and 47 of 126 in 1956.

If treatment of bovine mastitis by the intramammary injection of penicillin is contributing to the dissemination of resistant strains it is of concern to the medical profession. If the treatment of cows with "any of the newer antibiotics, such as the tetracyclines or erythromycin" is thought necessary "it is to be hoped that medical opinion will be consulted first. It would certainly seem desirable that all milk from animals so treated should be pasteurized." Staphylococci do not multiply to any dangerous extent in milk unless it is kept at an abnormally high temperature; their growth is discouraged by that of other bacteria (Smith, H. W., 1957) — [See *V.B.* 27, 1953]. Thus, paradoxically, milk of poor hygienic quality may be less dangerous from this point of view. The risks to the consumer from the presence of staphylococci in milk may be small, but the annotation calls for more information about bovine mastitis and about veterinary policy for its treatment. "The presence in milk of the antibiotic itself, the concentration of which may be quite high when regulations for discarding milk immediately after treatment are disregarded, is not a matter of complete indifference." — W.A.P.

WILSON, C. D. (1958). **Staphylococci in milk.** — *Brit. med. J.* June 14th, p. 1415. 3471

Replying to questions raised in an annotation on penicillin-resistant staphylococci in milk [see preceding abst.], W. pointed out that the commonest cause of bovine mastitis was now staphylococcal infection and that, while streptomycin, chloramphenicol and tetracycline antibiotics have been used for treating bovine mastitis in the United Kingdom since 1954, there has been no increase in the proportion of staphylococci resistant to these antibiotics between 1955 and 1958. It was improbable that milk was dangerous for human beings as a source of antibiotic-resistant strains of staphylococci. — R.M.

NILSSON, T. (1958). **Blood and milk proteins and protein-bound carbohydrates in bovine chronic mastitis. A paper electrophoretic study.** — *Acta path. microbiol. scand.* Suppl. No. 125. pp. 74. [In English.] 3472

Some of the biochemical changes in the blood serum and milk proteins of cattle with chronic mastitis (due to *Streptococcus agalactiae* or *Staphylococcus aureus* infection) were investigated. Total protein and quantitative and qualitative changes in the different proteins and glycoproteins separable by electrophoresis were studied. It was concluded that the ninhydrin-positive fraction of milk serum proteins appearing in mastitis milk was probably an immunoglobulin locally produced in the infected udder quarters. Furthermore, chronic mastitis, although a mild infection which clinically does not seem to affect the general health of the animal, caused a systemic reaction mirrored in an increase of gamma-globulin as well as an increased protein-bound carbohydrate content in the blood. — D. S. PAPWORTH.

JENSEN, R. S., KLAstrup, O., RØMER, O., SØRENSEN, B. & TERP, P. (1958). **Mastitis-undersøgelser i 8 bornholmske mejerikredse. [Studies on mastitis in 8 Bornholm dairy districts.]** — *Nord. VetMed.* 10, 361-392. [In Danish. Summaries in English and German.] 3473



Bacteriological examination was made on quarter samples from all cows in 8 dairy districts, as well as of churn samples from the same herds. As far as group B, C, G and L streptococci infections are concerned, 81.5% of the infected herds could be detected by a single churn-milk examination.

Cases, in which churn milk examination revealed these streptococci, although the examination of the herds gave negative results, ("false positive" can milk samples) comprised 17.9% of the number of infected herds or 3% of the total number.

Examination of churn-milk samples for coagulase-positive staphylococci was as reliable in the case of streptococci.

Infection with streptococci of groups C, G and L was relatively more frequent than group B infection. Infection with coagulase-positive staphylococci is fairly widespread.

There was a direct relation between the proportion of cows infected and the incidence of mastitis as diagnosed by Whiteside test or by increased cell number.

A brief description is given of the disturbances in secretion and teat lesions, demonstrated by a clinical examination compared with percentage of infection, milking technique (by hand or by machine), and width of stall.

Finally the main principles for a mastitis control programme were formulated.—R.M.

FODSTAD, F. H. (1958). Mastitis förorsaket av CAMP positive  $\alpha$ -hemolytiske gr. G-streptokokker. [**Mastitis caused by CAMP positive alpha-haemolytic group G-streptococci.**] — *Nord. VetMed.* 10, 431-436. [In Norwegian. Summaries in English and German. English summary modified.] 3474

At the Norwegian State Mastitis Laboratory 158 strains of group G-streptococci were isolated in 1957 from milk samples. 12 of the strains had biological properties typical of the group, but 146 showed various deviations. They were  $\alpha$ -haemolytic, CAMP positive, and varied in their fermentation reactions. The symptoms were gradual atrophy and induration of the affected quarters. Sensitivity to penicillin appeared to be the same as that of group B-streptococci.

NAI, D. D. (1958). Etiologia e patogenesi delle mastiti infettive dei bovini. [**Aetiology and pathogenesis of bovine mastitis.**]—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957, 11, pp. 33-166. Discussion: pp. 166-170. 3475

This paper is in two parts of which the first consists of the clinical, pathological and aetiological classification of the known types of mastitis. Each individual infection is dealt with

from every aspect. The second part is an exposition of the general considerations and conclusions drawn from the study of the important types of mastitis, their treatment and control. An extensive list of references to world literature is appended.—T.E.G.R.

MANTOVANI, G. (1958). Le alterazioni del latte conseguenti a processi infettivi della mammella. [**Changes in the milk of cows with mastitis.**]—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957, 11, pp. 171-292. Discussion: pp. 292-295. 3476

The different types of bovine mastitis are considered from a food hygiene point of view and are grouped as follows: infections caused by organisms prejudicial to public health; infections involving the general condition of the cow; infections affecting the secretion and quality of milk. The effects of mastitis on the physical and biological characters, chemical composition, and cytology of milk and milk products are reviewed in detail in separate sections, each followed by an extensive bibliography.—T.E.G.R.

HEIDRICH, H. J. & GROSSKLAUS, D. (1958). Der Einfluss der Milchstauung auf den Keimgehalt vorübergehend nicht gemolkener Euterviertel unter Antibiotikaschutz. (Vorläufige Mitteilung.) [**Effect of milk congestion and antibiotics on the bacterial content of quarters not milked for a time. (Preliminary communication.)**] — *Berl. Münch. tierärztl. Wschr.* 71, 193-194. [Summary in English.] 3477

Six cows received an injection of 100,000 i.u. of benzylpenicillin and 0.1 g. of dihydrostreptomycin sulphate in one quarter, which was not milked for the next 10 days. Before the trial, milk from these quarters contained micrococci, streptococci and Gram-positive rods (Bacteriaceae). At the end of it, 2 quarters were sterile and 4 contained only micrococci. The content of micrococci was low in 3 of these 4.—M.G.G.

SMITH, H. (1958). Symposium on recent developments in immunization against bacterial disease. The basis of immunity to anthrax.—*Proc. R. Soc. Med.* 51, 375-377. [Author's summary modified.] 3478

Of the two main virulence factors of *Bacillus anthracis*—namely the toxin and the capsular polyglutamic acid—the toxin is immunogenic and forms the prime basis for immunity to anthrax. The toxin consists of two factors which act synergically, and lose their toxicity very easily while retaining their antigenicity. A non-toxic immunogenic vaccine pre-



pared *in vitro*—an excellent practical vaccine—contains components which are closely connected with both factors of the anthrax toxin.

BROWN, E. R., MOODY, M. D., TREECE, E. L. & SMITH, C. W. (1958). **Differential diagnosis of *Bacillus cereus*, *Bacillus anthracis*, and *Bacillus cereus* var. *mycoides*.**—*J. Bact.* **75**, 499-509. [Authors' summary modified.] **3479**

A critical evaluation was made of the techniques commonly employed for the identification of *B. anthracis*, *B. cereus*, and *B. cereus* var. *mycoides*, using large numbers of strains representing each species. Absence of motility, susceptibility to certain phages (especially  $\gamma$ ), and pathogenicity of small inocula for rabbits appear to be the main characteristics differentiating *B. anthracis* from other closely related Gram-positive bacilli. Attention was directed to the significance, for the study of genetic development, of the artificial selection of pathogenicity in *B. anthracis* resulting from serial passage on blood-glucose media. It was concluded that the names *Bacillus cereus*, *Bacillus cereus* var. *anthracis*, and *Bacillus cereus* var. *mycoides* furnish the most appropriate taxonomic description of these organisms.

MOLOMUT, N. (1958). **Stimulation of epithelioid cell response in experimental pig tuberculosis.**—*J. Bact.* **75**, 584-585. [Author's summary modified.] **3480**

The effect of anti-splenic tissue serum on g.pigs with experimental TB. was studied histologically. Treated animals had a much greater epithelioid cell reaction and less caseation necrosis than controls.

I. ANON. (1958). **Cultivation of *Mycobacterium tuberculosis*. Part IV. Methods of homogenization.**—*Mon. Bull. Minist. Hlth Lab. Serv.* **17**, 99-103. **3481**

II. ANON. (1958). **Cultivation of *Mycobacterium tuberculosis*. Part VII. Period of incubation.**—*Ibid.* 118-122. [Summaries modified.] **3482**

I. The method of Jungmann & Gruschka for homogenizing sputum was compared with later modifications of this method introduced by Nassau which use less toxic concentrations of hydrogen peroxide. The modification in which sodium citrate is used in place of distilled water before centrifugation to neutralize the acidity of the homogenized sputum, gave the best results. These were greatly superior to those of the original method and rather better than those given by 4% sodium hydroxide.

II. To determine whether prolonging the incubation period would substantially raise the proportion of positive cultures of tubercle bacilli

670 microscopically negative specimens of sputum were examined. The sputum was homogenized with 4% NaOH, and neutralized with 8% HCl. Cultures were made from one part without centrifugation (Method 5) and from the centrifuged deposit (Method 2) of the other part. By both techniques the further two weeks' incubation increased the number of positive specimens by between 5 and 7%, or by about 1% of the specimens which were still negative at the end of six weeks' incubation.

In a further investigation routine subculture of Kirchner cultures on to Löwenstein-Jensen slopes after incubation for four and six weeks had no appreciable effect on the total number of positives recorded, though it occasionally accelerated the result.

Microscopic examination of Kirchner cultures after eight weeks' incubation afforded no advantage over routine subculture.

It was concluded that the advantage of incubating cultures beyond six weeks did not compensate for the extra apparatus and incubator space required.

THIEL, W. (1957). Die Verwendbarkeit der Feldmaus (*Microtus arvalis*) zur Typendifferenzierung von Tuberkelbakterien. [Use of the vole (*Microtus arvalis*) for type differentiation of tubercle bacilli.]—*Z. Hyg. InfektKr.* **144**, 260-266. **3483**

Susceptibility of voles to bovine type tubercle bacilli was relatively high, producing generalized TB. within 10 weeks. Human type bacilli produced no lesions but were demonstrable microscopically in liver and spleen. Avian type bacilli neither produced visible lesions, nor were they demonstrable microscopically in organs.—E.G.

KEMKES, B. & KIENHOLZ, M. (1957). Über die Wirkung ätherischer Meerrettichöle auf Tuberkelbakterien. [Action of volatile oils from horseradish on tubercle bacilli.]—*Z. Hyg. InfektKr.* **144**, 148-151. **3484**

By affecting their acid-fastness, horseradish oil produced lysis in tubercle bacilli, transforming them into an amorphous mass. Growth in Hohn egg medium (substrate 4) and in Kirchner substrate 30 was either partly or completely inhibited, according to the amount of oil added. Two g.pigs, injected with saline-resuspended sediment of centrifuged culture, containing about 400 million tubercle bacilli, the growth of which had been inhibited by horseradish oil, failed to develop TB. during a period of observation of 12 weeks. P.M. there were no lesions, apart from non-specific inflammation.—E.G.



WALLACE, J. H. (1958). **Leukocytic transfer of delayed sensitivity to normal guinea pigs from rats infected with *Mycobacterium leprae-murium*.**—*J. Immunol.* **80**, 362-366. [Abst. from discussion.] **3485**

The data presented indicate that the inability of the sensitized rat to display cutaneous reactions is not a result of the inactivity of the leucocytes of such animals. Normal g.pigs, injected with cellular components from rats responding to infection with the rat leprosy bacillus, gave delayed skin reactions which were readily distinguishable from responses to control materials. Thus, the rat cell would appear to possess properties and potentialities similar to those exhibited by cells from species which display this classical type of sensitivity.

It is of interest that OT incited no response in g.pigs which received intracardial or intraperitoneal injection of active cellular material, while the rat leprosy antigen elicited positive responses. These specific reactions suggest that the sensitivity of donor animals to the rat leprosy organism was quantitatively greater than to the related mycobacteria. The observation that cell-OT mixtures provoked response by the intradermal method is explicable on the basis of cross reactivity.

MLINAC, F. & HAJSIG, M. (1958). **Corynebacterium pyogenes u zamorčeta. [Spontaneous *Corynebact. pyogenes* septicaemia in a guinea-pig.]**—*Vet. Arhiv.* **28**, 43-48. [In Croat. Summaries in English and German.] **3486**

The isolated strain did not differ from other strains isolated from human beings and animals. —R.M.

LUSBY, M. & LEVINE, H. B. (1958). **An intracellular mortality-enhancing material from *Malleomyces pseudomallei*.**—*J. Immunol.* **80**, 446-453. [Authors' introduction modified.] **3487**

That mice infected with *M. pseudomallei* [*Pfeifferella whitmori*] frequently died in 2 days or less without observable gross lesions, prompted Nigg & others [*V.B.* **26**, 3365] to investigate the toxins. While lethal toxic material was obtained from a number of strains, a correlation was not found between the toxin yield and virulence. It appeared that the lethal attributes of *M. pseudomallei* depended also on other factors probably acting in conjunction with toxic material.

To explore the influence of cell constituents in infection, strains of intermediate virulence were inoculated into mice along with intracellular material from a virulent strain. The

findings indicated the presence of a relatively non-toxic component which rendered the host less resistant to the lethal effects of infection with *M. pseudomallei*. This communication describes some of the biological and physico-chemical properties of the active component and methods for its preparation, assay and partial purification.

ROWSSELL, H. C. (1958). **A cultural and biochemical study of strains of *Erysipelothrix rhusiopathiae* with special reference to the carrier pig.**—*Canad. J. comp. Med.* **22**, 82-86. **3488**

*E. rhusiopathiae* was recovered from the tonsils of 11% of a drove of swine in which erysipelas had previously occurred. The agglutination test failed to detect these tonsillar carriers since 19 or 44% of the non-vaccinated pigs possessed a titre of 1:100 and only five of these proved to be tonsillar carriers. Carriers were not as frequent in the vaccinated group.

The strains of *E. rhusiopathiae* isolated produced variable results in biochemical media. In the carbohydrates more or less consistent fermentation was only observed in lactose, glucose, laevulose (fructose) and galactose. The tonsillar isolates produced a variation in the fermentation of mannose and litmus milk and it appeared that these strains of *E. rhusiopathiae* were slightly more active biochemically than strains isolated from pathological lesions.

The result indicated the most reliable reaction was the test tube brush effect in gelatin and it is recommended that this be considered a necessary cultural criterion for the identification of *E. rhusiopathiae* in the diagnostic laboratory. —R. V. L. WALKER.

LAWSON, K. F., WALKER, V. C. R. & CRAWLEY, J. F. (1958). **Modified swine erysipelas vaccine.**—*Canad. J. comp. Med.* **22**, 164-174. [Summary in French.] **3489**

A culture of *Erysipelothrix rhusiopathiae* called the C<sub>1</sub> strain was proved sufficiently attenuated for use in a vaccine. This strain in heavy concentration failed to kill mice (weighing 10 g.) on inoculation and did not affect the growth rate of young pigs. No deaths occurred in over 5,000 pigs vaccinated in field tests. A localized reddening at the site of injection in many vaccinated pigs did not prove serious and was indicative of a "take".

Under various trials it was proved that the vaccine did not produce carriers or "shedders" of the infectious agent nor was there any indication of reversion to virulence under intensive field trials.



Immunity persisted for at least six months and laboratory studies and field observations revealed the reduction or even complete elimination of the incidence of arthritis after use of the vaccine in pigs 8-12 weeks of age.

—R. V. L. WALKER.

VANCE, H. N. & WHENHAM, G. R. (1958). An erysipelas outbreak in chickens.—*Canad. J. comp. Med.* **22**, 86-87. 3490

*Erysipelothrix rhusiopathiae* was isolated from tissues of hens which died from an acute infection. Intramuscular treatment with aqueous penicillin and penicillin in oil was effective in reducing losses.—A. S. GREIG.

I. BRILL, J., MIKULASZEK, E. & TRUSZCZYŃSKI, M. (1957). Immunochemical investigations into the antigenic structure of the erysipeloid bacterium.—*Bull. Acad. polon. Sci. (Sér. Sci. Biol.)* **5**, 405-411. [In English.] 3491

II. TRUSZCZYŃSKI, M. (1957). Middlebrook-Dubos reaction in erysipelas.—*Ibid.* 413-418. [In English.] 3492

I. The authors studied the serological properties of nucleoprotein and polysaccharide fractions of *E. rhusiopathiae*, serological type A, obtained by chemical extraction. It was concluded that there were two polysaccharide haptens differing in chemical composition and serological specificity. One of the haptens (named C<sub>1</sub>) was combined with protein and was also incorporated in nucleoprotein fractions. The other (C<sub>2</sub>) could be released from within the cell membrane by the action of alkali. The type-specificity of the erysipelas organism was attributed to the C<sub>1</sub> hapten.

II. Various polysaccharide and nucleoproteins obtained from the previous studies were used as antigens in the haemagglutination reaction of Middlebrook & Dubos. Polysaccharide fraction C<sub>1</sub> exhibited the greatest serological activity, while fraction C<sub>2</sub> was devoid of activity. Titres of agglutination tests corresponded with, but were generally higher than, those of haemagglutination tests employing C<sub>1</sub> antigen with sera from infected or immune pigs.—R.M.

DIAS, V. M. & DA SILVA, N. P. M. (1958). Unterscheidung zwischen *Listeria monocytogenes* und *Erysipelothrix rhusiopathiae* mittels des Triphenyltetrazoliumchlorids. [Differentiation of *E. monocytogenes* and *E. rhusiopathiae* by means of triphenyltetrazolium chloride.]—*Zbl. Bakt. I. (Orig.)* **171**, 317-318. 3493

The tetrazolium salt was added to meat-peptone broth (plus 5% horse serum) at 0.1 ml.

of a 1% soln. per ml. of medium. At 25° or 37°C. an intensive reddening developed in cultures of *E. monocytogenes* within 2 hours while cultures of *E. rhusiopathiae* remained colourless, becoming pale pink after 2 hours.—R.M.

BAIN, R. V. S. & JONES, R. F. (1958). The production of dense cultures of *Pasteurella multocida*.—*Brit. vet. J.* **114**, 215-220. [Authors' summary modified.] 3494

A vortex aeration vessel made of stainless steel is described, for the continuous or batch cultivation of *Past. septica* Type I. In a casein hydrolysate medium, yields of up to 2 g. dry weight of bacteria per litre are obtained. The formolized culture is suitable for the direct manufacture of oil-adjuvant vaccine.

KEPPIE, J., COCKING, E. C. & SMITH, H. (1958). A non-toxic complex from *Pasteurella pestis* which immunises both guinea pigs and mice.—*Lancet* February 1st, 246-247. 3495

Five cardinal facts emerge from the experimental work on *Past. pestis* infection. (1) Mice can be immunized by dead vaccine, but only low-grade immunity develops. (2) G.pigs and mice can be immunized by living attenuated vaccines. (3) The use of living attenuated vaccines in man was prompted by the argument that man should have the benefit of antigens found to be effective in both mice and g.pigs. (4) Mice could be protected by fraction I<sub>5</sub>; it was, however, less effective in g.pigs. 'Residue antigen' afforded some protection in both mice and g.pigs. (5) Fraction I possibly confers low-grade protection in man. (6) Vaccines prepared from whole dead *Past. pestis* are toxic.

The authors examined the protective value of fractions separated from *Past. pestis* isolated from g.pigs dying from artificial infection. They demonstrated a non-toxic complex antigenic for g.pigs and mice. Later, they obtained a similar complex from cultures.

The antigen was prepared by submitting an aqueous suspension of the organisms to ultrasonic waves. The residue contained no intact organisms; it constituted about 30% of the whole organism and dissolved almost completely when treated with ultrasonic waves in 0.05 M NaHCO<sub>3</sub> or 0.02 M tris(hydroxymethyl) aminomethane at pH 8.5 or 8.7. A suspension in saline was harmless to mice and g.pigs after heating at 60°C. or as a solution filtered through 'millipore'. Tests of active immunity on g.pigs and mice were satisfactory.

The authors conclude that the residue from ultrasonic treatment is a complex containing fraction I, a virulence antigen, and at least one



other lipid-containing component; that *Past. pestis* has a cell-wall complex containing lipid, to which fraction I is attached firmly near the cell wall and loosely in the body of the envelope; that the same state of affairs probably exists with regard to the virulence antigen; that this cell wall complex with the attached envelope is probably the best antigen for the protection of all species; that if it is split by autolysis, acetone drying and to a lesser degree by washing or treatment by ultrasonic waves some of the antigenic power is lost.—W.A.P.

DAVIES, M. E. (1958). **Some observations on the antigenic structure of *Escherichia coli* isolated from the dog.**—*Brit. vet. J.* **114**, 198-200. [Author's conclusion modified.] **3496**

Ten strains of *E. coli*, isolated from dogs, were classified according to their O and K antigens. One was identified as belonging to a group associated with calf scours, and a limited relationship was apparent with 6 other strains. No serological relationship with strains from cases of infantile diarrhoea was found.

HAMILTON, C. M. & CONRAD, R. D. (1958). **Extreme mortality in Hjarre's disease (coli-granuloma) in chickens.**—*J. Amer. vet. med. Ass.* **132**, 84-85. **3497**

Hjarre's disease broke out in two flocks of 2,000 and 1,100 pullets. In both flocks over 75% of the birds were affected. Lesions resembling those of advanced generalized TB. were found, from which a mucoid-encapsulated *Escherichia coli* was isolated. Experimental chickens inoculated with this organism did not develop any pathological lesions. Both farms have since raised chickens without further evidence of the disease.—M.G.G.

ANON. (1958). **Supplement to the sixth report on the *Salmonella* group. The Enterobacteriaceae Subcommittee of the Nomenclature Committee of the International Association of Microbiologists. List of serotypes of *Salmonella* recognized by the Subcommittee since the fifth report in 1953.**—*Int. Bull. bact. Nom. Taxon.* **8**, 79-92. **3498**

An alphabetical list of 282 new serotypes, with formulae and references.—R.M.

MÜLLER, J. (1958). ***Salmonella naestved* (1,9,12: gps: -), en ny salmonellatype isoleret fra kalve. [*S. naestved*, a new serotype isolated from calves.]—*Nord. VetMed.* **10**, 437-443. [In Danish. Summaries in English and German. English summary modified.] **3499****

A new salmonella type with the serological formula 1, 9, 12: gps. was isolated from the

organs of 4 dead calves, aged 2-6 weeks, one from one herd and three from another. In the second farm 65 faeces samples from the cattle, pigs, fowls and turkeys were examined bacteriologically. Nine samples of concentrates, including samples of two commercial whole-milk substitutes, were also examined. *Salmonella* bacteria were not demonstrated in any of these samples. The origin of the infection with the new salmonella type remains obscure.

TESTI, B. (1958). **Rara localizzazione articolare da *S. pullorum* in pulcini da carne. [Presence of *Salmonella pullorum* in the joints of battery-reared chicks.]—*Zooprofilassi* **13**, 85-101. **3500****

In two breeding establishments there was high mortality during the first week of life and retarded growth among the survivors. Marked articular swellings occurred at 30-40 days, followed by some mortality. By the 70th day total mortality was 75%. The tibio-tarsal joint, on its lateral aspect, was usually affected. Cultural and biological tests with joint exudate revealed *S. pullorum*.—T.E.G.R.

SCHEINER, A. (1958). **Praktische Vorschläge zur Bekämpfung der Brucellose abortus Bang. [Control of brucellosis.]—*Tierärztl. Umsch.* **13**, 131-134. **3501****

The Meinicke flocculation test has been found very satisfactory and should not be omitted as a routine in young animals; in many cases it has been found weakly positive much earlier in known nonvaccinated herds than the slow agglutination test. The serum ring test is very useful as a rapid orientating test especially in a freshly infected herd.

S. summarizes the methods of brucellosis elimination as follows:—(a) very careful management of the infected farm; (b) in lightly infected areas elimination of the infected animals is the best way; vaccination of the young animals in such areas is not usual and should only be done if officially approved; (c) in more heavily infected areas, vaccination is indispensable; (d) serum titres after vaccination must be differentiated from those after natural infection. Titres of 1:40 to 1:80 must be considered doubtful and a complement-fixation test performed in addition.

In the Hanover Vet. Dept. the Meinicke flocculation, and the ring tests are used for routine investigation, only doubtfuls and positives being tested by the slow agglutination and the full Meinicke tests.—W. K. DUNSCOMBE.

PARNAS, J. & MIERZEJEWSKA, J. (1958). **Investigations on specificity of opsonocytotoxic**



test in the course of chronic brucellosis.—*Z. ImmunForsch.* **115**, 306-321. [In English. Summaries in French, German, Spanish and Russian.] **3502**

Results of opsonocytophagic tests on sera from human beings and lab. animals chronically infected with brucellosis and other diseases were expressed by Huddleson's index and by Foshay's index. There was no definite correlation with agglutination tests, c.f. tests, and leucocyte count, but the test was relatively specific for brucellosis.—R.M.

VAN DER SCHAAF, A. & JAARTSVELD, F. H. J. (1958). Het isoleren van *Brucella abortus* uit sperma door kweek op voedingsbodems met "Abro". [Isolation of *Br. abortus* from semen by culture on a medium containing a detergent.]-*Tijdschr. Diergeneesk.* **83**, 345-351. [In Dutch. Summaries in English, French and German.] **3503**

The detergent "Abro" was stated to be composed of a secondary alkylsulphate, alkylaryl-sulphonate and a "nonionic" component. It was used at a conc. of 1.25% in blood agar medium. Plates were incubated in 10% CO<sub>2</sub> for 3-5 days. The detergent inhibited the spread of *Proteus* species, which otherwise concealed the growth of *Br. abortus*.—R.M.

LERCHE, M. & ENTEL, H. J. (1958). Differenzierung von *Brucella*-Stämmen, die aus serologisch positiv reagierenden Schlachtrindern gezüchtet wurden. [The differentiation of *brucella* strains isolated from serologically positive slaughter cattle.]-*Zbl. VetMed.* **5**, 339-356. [Summaries in English, French and Spanish.] **3504**

The report deals with the examination of 1017 cattle in Berlin abattoirs and subsequent type differentiation of *brucella*, by the usual methods. 51 of the animals were serologically, and 41 of these bacteriologically positive; (39 *Br. abortus* and 2 *Br. suis*). Organisms were isolated in 51% from the uterus, 49% from the milk, and in no less than 14% from the blood. In some instances g.pig inoculation was necessary. Out of the 41 animals *brucella* was isolated from the tissues and organs 96 times; all the organisms were in the S-phase. The *Br. suis* infection is considered an example of strain/species overlap. In view of the grave prognosis of human infections with this strain the danger to all working in abattoirs is emphasized.—W. K. DUNSCOMBE.

BISPING, W. (1958). Papierelektrophoretische Untersuchungen des Blutserums gesunder, brucelloseinfizierter und gegen Brucellose

schutzgeimpfter Rinder. [Studies by paper electrophoresis on the serum of healthy cattle and cattle infected with brucellosis and immunized against it.]-*Zbl. VetMed.* **5**, 493-504. [Summaries in English, French and Spanish. English summary modified.] **3505**

The sera of 20 healthy cattle, 24 with brucellosis and 20 vaccinated animals were examined by paper electrophoresis. No important differences between the groups could be detected. Considerable physiological changes even within the group of healthy cattle reduced the value of single determinations, so the analyses were repeated on calves and g.pigs before and after vaccination. Five calves were vaccinated with Strain 19 and 3 with the same strain adsorbed on aluminium hydroxide, and 7 calves were given various killed vaccines adsorbed on aluminium hydroxide. The g.pigs received 2 injections of a live virulent culture at an interval of 12 days. The inoculated groups showed a mean rise in gamma-globulin, individual animals varying considerably. The reasons for these variations are discussed. At present it cannot be assumed that an increase in gamma-globulin is equivalent to the acquisition of an immunity. Further studies are necessary.

KING, N. B., EDGINGTON, B. H. & FRANK, N. A. (1958). The use of Huddleson's *brucella* M vaccine under field conditions.—*Amer. J. vet. Res.* **19**, 93-96. **3506**

In 12 *brucella* infected herds, 487 cows and heifers serologically negative at the time of injection were vaccinated with 1 ml. of Huddleson's *brucella* mucoid vaccine. During the 24-month observation period, 114 became reactors (23.4%) compared with 21 of the 60 nonvaccinated controls (39.9%). Approximately 27.4% of the controls aborted or had premature calves compared with only 8.8% of the vaccinated animals. Although in some instances, a 1-2 dilution rise in blood titres occurred 10-15 days after vaccination, negative levels were present within 90 days in all non-infected animals.

—A. ACKROYD.

DAFNI, I. (1958). [Bovine brucellosis and vaccination with Strain 19 vaccine.]-*Refuah vet.* **15**, 1-8 [In Hebrew. English summary p. 52.] **3507**

Good control of bovine brucellosis was achieved in Israel following the immunization of all adult cattle with Strain 19 in 1950, and the commencement of a scheme for immunizing calves. Recently, however, confusion has arisen over the difficulty in distinguishing between vaccination and infection reactions to serological



tests and the failure in some districts to ear-mark vaccinated calves. D. proposed a scheme to overcome these difficulties, based on experience gained in other countries.—R.M.

HULSE, E. C. (1958). **Strain 19 and other Brucella vaccines.**—*Proc. R. Soc. Med.* **51**, 377-380. **3508**

Methods under investigation at Weybridge for improving the production and keeping qualities of Strain 19 brucella vaccine include the continuous liquid culture system and freeze-dried vaccine suspended in Smith-Naylor medium in rubber-stoppered bottles. An adjuvant vaccine derived from the non-agglutinogenic strain 45/20, whilst not as efficient as the Strain 19 vaccine, has shown promising results and may be of use for the vaccination of older animals.—A. ACKROYD.

SPINK, W. W. (1957). **The significance of bacterial hypersensitivity in human brucellosis: studies on infection due to Strain 19, *Brucella abortus*.**—*Ann. intern. Med.* **47**, 861-874. **3509**

S. commented on the inadequacy of knowledge about the fundamental mechanisms of many infectious diseases in man. He studied host-parasite factors in brucellosis, with particular reference to hypersensitivity. In a period of seven years he observed the illness in four veterinarians following accidental inoculation with Strain 19. He stated that there were only four reports of human infection by this strain. The illness in these four veterinarians was related to acquired and specific bacterial hypersensitivity. Two had had brucellosis previously and the other two had not. S. considered that relapses in recovered brucellosis patients are sometimes the result, not of re-infection, but of contact with non-viable antigen. He considered that the course of the illness in his four patients indicated some analogy with serum sickness.

Objective evidence of hypersensitivity is afforded by the reaction to a skin test with brucella antigen and by an exaggeration of the symptoms when the antigen is injected into the bloodstream.

In the g.pig when brucella organisms are introduced into the skin there is an immediate mobilization of polymorphonuclear leucocytes and then of macrophages at the site. The surviving organisms pass quickly to the regional lymph nodes. Phagocytosis and destruction of the organisms occurs in the nodes, but organisms can also multiply and invade the bloodstream. Antibacterial factors operate

in the blood, with lysis of the bacilli and liberation of endotoxin. Organisms that survive localize intracellularly within the liver, spleen, lymph nodes and bone marrow and both destruction and multiplication take place, with re-invasions of tissues.

After primary entrance into the host, brucella organisms can be demonstrated within the sinusoids of the liver within a few hours. During this time sensitization of tissues occurs as well as distribution and proliferation of the organisms. The host may not exhibit symptoms of brucellosis immediately following invasion of the tissues, and there may be an interval of weeks or months before illness occurs.

When re-infection occurs in an experimental animal or in man an explosive inflammatory reaction takes place at the portal of entry, reminiscent of Koch's reaction in TB.

He concluded that endotoxin plays a major role in the illness. The endotoxin of the most invasive strains of brucella was no more toxic than endotoxin from Strain 19, and he postulated that, if Strain 19 could multiply in a human host, severe disease would result. The failure of the occasional patient to yield a skin reaction to brucella antigen after a severe attack of the disease is comparable to the equivalent behaviour of the patient with advanced TB.

The undesirable effects of brucella endotoxin can be subdued by adrenocorticosteroids and corticotrophin. Cortisone protects intact mice against lethal doses of endotoxin. Hydrocortisone, 9 alpha-fluorohydrocortisone and also aldosterone protect adrenalectomized mice against brucella endotoxin.

S. stated that there was no known instance of infection of a human being that had its origin in cattle immunized with Strain 19. Strain 19 has been used for the immunization of human beings heavily exposed to *Br. melitensis* in Russia. He did not consider that this was sound policy as in tests on animals it had been found not to protect against *Br. melitensis*.—W.A.P.

OLITZKI, A. L. & SULITZANU, D. (1958). **Studies on the antigenic structure of *Brucella suis* with the aid of the agar gel precipitation technique. I. The resistance of antigens to physical, chemical and enzymatic treatments.**—*Brit. J. exp. Path.* **39**, 219-227. [Abst. from Survey of paper (p.i).] **3510**

The authors applied a variety of physical and chemical procedures to *Br. suis*, and by agar gel precipitation and absorption studies identified a maximum of 6 antigens in the extracts obtained. The optimum conditions for re-



lease and the resistance of these antigens to heat and chemicals, including proteolytic enzymes, were examined.

RENOUX, G. (1958). Préparation des sérums monospécifiques anti-abortus et anti-melitensis. [Preparation of *Br. abortus* and *Br. melitensis* monospecific serum.]—*Arch. Inst. Pasteur Tunis* **35**, 87-94. **3511**

The technique for the preparation of monospecific sera in rabbits is described and attention is drawn to essential details: complete absence of brucella antibodies from the rabbits; careful selection of smooth colonies of brucella; perfectly dry culture media and avoidance of excessive incubation which will result in bacterial dissociation; administration of only one i/v injection of living brucella to the rabbits and bleeding before the eighth day after inoculation; absorption of heterologous antibody by living brucella; evaluation of the monospecific serum by the agglutination test, using several known strains of *Br. melitensis* and *Br. abortus*, after 48 hours' incubation; rejection of sera showing the slightest trace of heterologous agglutinin.

—T.E.G.R.

HUNTER, C. A., BURDORFF, R. & COLBERT, B. (1958). Flocculation tests for tularemia.—*J. Lab. clin. Med.* **51**, 134-140. **3512**

The agglutination test is one of the most useful and reliable tests for the diagnosis of tularemia. The authors studied flocculation tests. They prepared a cholesterol, lecithin, *Brucella tularensis* extract antigen emulsion for a microscopic slide test and macroscopic tube flocculation test. The sensitivity and specificity of the antigen emulsion could be adjusted to conform to the standard antigen emulsion. They described the work done in detail.—W.A.P.

BOULANGER, P., MITCHELL, D., SMITH, A. N. & RICE, C. E. (1958). Leptospirosis in Canada. III. A study of the importance of the disease in cattle as shown in combined serological, clinical and bacteriological investigations.—*Canad. J. comp. Med.* **22**, 127-143. **3513**

The authors present results of a comprehensive study with 7 tables on 20 herds with reproductive problems. Leptospirosis proved to be the aetiological agent in six herds while in four others, although serological reactions were obtained with specific antigen, the disease could not be correlated with existent conditions in the individual animals.

The course of infection varied since in some herds spread was noted to practically all adult animals by clinical, serological and cultural

methods, while in other herds the infection remained limited to one single animal.

Culture isolations and serological reactions indicated that *L. pomona* was most commonly involved, although *L. sejroe* was shown in a few instances.—R. V. L. WALKER.

DACRES, W. G. & KIESEL, G. K. (1958). Isolation of *Leptospira pomona* from a bovine fetus.—*J. Amer. vet. med. Ass.* **132**, 525-526. [Authors' summary modified.] **3514**

*L. pomona* was isolated from a bovine foetus aborted at about 4½ months. The pathogenicity of this organism for cattle was demonstrated when 2 inoculated calves became infected. A suggested reason for the difficulty in isolation from a foetus is given.

KEMENES, F. (1958). Leptospiral serotypes in Hungary.—*Acta vet., hung.* **8**, 43-51. [In English.] **3515**

Of 59 strains of leptospira isolated in Hungary, 36 were *L. pomona* (17 from pigs, 10 from cattle, 5 from horses, 2 from man, and 1 from a rat), 15 were *L. hyos* (all from pigs), 3 were *L. canicola* (from dogs), 3 were *L. saxkoebing*, and 2 were provisionally identified as *L. sejroe*. —M.G.G.

FÜZI, M. & KISZEL, J. (1958). Die Leptospireninfektion der Hunde in Budapest. [Canine leptospirosis in Budapest.]—*Acta microbiol. Acad. Sci. Hung.* **5**, 53-57. [In German.] **3516**

In 1955 the sera of 104 dogs in Budapest were tested against 11 serotypes; 21 dogs were positive, 16 to *L. canicola*, 3 to *L. sejroe*, and 2 to *L. pomona*. No dog showed clinical symptoms. The incidence of infection increased with age. No human case of canicola fever in Budapest has been recorded. This suggests that farm animals may be the chief source of *L. canicola* infection for man. No positive titres for *L. icterohaemorrhagiae* were found. [See also V.B. **28**, 2055.]—M.G.G.

ZAHARIJA, I. & ZELENKA, P. (1958). Enterotoksemija krava uzrokovana sa *Cl. perfringens*. [Clostridium welchii as cause of enterotoxaemia in cows.]—*Vet. Arhiv.* **28**, 17-22. [In Croat. Summaries in English and German.] **3517**

*Cl. welchii* Type A was isolated from the spleen of 2 cows which had died from enterotoxaemia.—R.M.

GEE, R. W. & AUTY, J. H. (1958). Post-surgical tetanus in a dog.—*Aust. vet. J.* **34**, 156-157. [Authors' summary.] **3518**

A fatal case of tetanus following intramedullary fixation in the dog is described. The



administration of chlorpromazine had little effect on the development of muscular tetany. Post-operative prophylactic penicillin failed to prevent the disease and treatment with penicillin and tetanus anti-toxin was unsuccessful.

SCHELLENBERG, D. B. & MATZKE, H. A. (1958).

**Development of tetanus in parabiotic rats.**—*J. Immunol.* **80**, 367-373. [Authors' summary modified.] **3519**

Tetanus toxin inoculation of parabiotic rats produces symptoms in the injected parabiont comparable to those seen in single animals: ascending and general tetanus following i/m injection, and blood-borne tetanus following i/v inoculation. In the latter case, the uninjected parabiont also develops blood-borne tetanus.

When i/m inoculated pairs without nerve crosses are left united the uninjected parabiont does not develop typical tetanus, but dies in a condition of respiratory distress designated "aspartic respiratory tetanus". It is suggested that some lethal agent other than unaltered toxin causes this condition and the death of the animal.

Following i/m inoculation of pairs with nerve crosses the uninjected parabiont develops local tetanus which may advance to ascending and general tetanus and death. Thus tetanus toxin can travel directly from the site of i/m inj. to the spinal cord of the uninjected parabiont by way of a crossing nerve trunk.

Following i/m inocn. of pairs without nerve crosses the uninjected parabiont does not develop blood-borne tetanus unless it is separated from its injected partner, even though it apparently receives and fixes a lethal dose of toxin. The possible significance of this is discussed.

FULTHORPE, A. J. (1958). **Tetanus antitoxin titration by haemagglutination at a low level of test.**—*J. Hyg., Camb.* **56**, 183-189. [Author's summary modified.] **3520**

For estimating the antitoxin content of small samples of human sera the direct agglutination test appears to be satisfactory when dealing with groups of sera, but unreliable for individual sera.

The discrepancies observed in the direct agglutination test were greatly reduced by adopting an agglutination inhibition test at a level equivalent to 0.01 standard units of antitoxin.

The difference in agglutinating capacity of both avid and non-avid sera per *in vivo* unit of antitoxin did not appear to be related to avidity.

MAY, A. J. & WHALER, B. C. (1958). **The absorption of *Clostridium botulinum* type A**

**toxin from the alimentary canal.**—*Brit. J. exp. Path.* **39**, 307-316. [Abst. from Survey of paper (p. ii).] **3521**

An account of experiments with rats, mice and rabbits, using the Type A toxin. By feeding, and by inoculation of isolated portions of the gut with toxin, it was shown that greatest absorption occurred in the upper small intestine. Toxin was demonstrable in the thoracic duct, and cannulation of the intestinal or abdominal thoracic lymph vessels in rats gave partial or complete protection to animals fed toxin in their drinking water.

ROBERTS, D. S. & SIER, A. M. (1958). **Vibrionic infertility in Western Australian dairy cattle.**—*Aust. vet. J.* **34**, 186-189. [Authors' summary modified.] **3522**

An account is given of the recent application, in Western Australia, of the *Vibrio fetus* mucus-agglutination test using two Weybridge strains. Results from 94 herds, some fertile and some infertile, confirmed the specificity of the test. Vibriosis is apparently the immediate cause of infertility in at least 75% of all seriously infertile dairy herds in Western Australia.

POWER, J. H. (1958). **A note on the isolation of *Vibrio fetus* from bull semen by direct cultivation.**—*Vet. Rec.* **70**, 237 & 240. **3523**

Successful isolation of *V. fetus* from bull semen by direct cultivation is described. The medium contains Bacto-peptone (Difco) 10 g., agar 15 g., Lab. Lemco 5 g., sodium chloride 5 g., and glass distilled water 1000 ml. and is distributed in 100-ml. screw-capped bottles. To each of these after autoclaving is added 10 ml. of defibrinated ox blood, 56.8 units per ml. of polymyxin B sulphate, and 1 part in 333,000 of brilliant green and the mixture poured into Petri dishes. Five plates per sample are incubated for 3-6 days at 37°C. in sealed 3½-litre glass jars containing hydrogen, carbon dioxide and air.—A. ACKROYD.

GRÖGEL, K. F. (1957). **Das Vorkommen und der bakteriologische Nachweis von Vibrionen beim weiblichen Rind. [Occurrence and bacteriological identification of vibrios in female cattle.]**—*Inaug. Diss., Munich* pp. 49. **3524**

Three methods of collecting vaginal mucus were compared in 200 slaughter cattle. No method detected more than about half the total number of cases of vibrio infection; two methods combined detected 75% of the cases. Vibrios were identified microscopically in 96 of 300 specimens of placenta or foetus from cows which had aborted. In 38 of the 96, other causes of



abortion were also identified (brucella 18 times, fungi 6 times, *C. pyogenes* 3 times etc.) Of 14 pure cultures of vibrios obtained from this material, 13 were *V. fetus* and 1 was a catalase-negative strain.—R.M.

MCKAY, D. G. & SHAPIRO, S. S. (1958). Alterations in the blood coagulation system induced by bacterial endotoxin. I. *In vivo* (generalized Schwartzman reaction).—*J. exp. Med.* **107**, 353-367. 3525

MCKAY, D. G., SHAPIRO, S. S. & SHANBERGE, J. N. (1958). Alterations in the blood coagulation system induced by bacterial endotoxins. II. *In vitro*.—*Ibid.* 369-376. [Authors' summaries modified.] 3526

I. Intravenous injection of bacterial endotoxins alters the coagulation system of rabbits' blood *in vivo*. 24 hours after the first injection the fibrinogen level rises to twice normal values. The second injection at this time causes a 30 to 40% decrease in fibrinogen content in 4 hours, with a rise to twice normal values 20 hours later. A marked decrease in whole blood coagulation times in silicone occurs 4 hours after both injections, with a rise to normal values 24 hours after each inj. The circulating platelets drop from average levels of 300,000/cu. mm. to 150,000 per cu. mm. after the first injection, and further decrease to less than 100,000 after the second inj. During this time no fibrinolytic or fibrinogenolytic activity can be detected. Also, there is no significant change in the one stage prothrombin times or antithrombin titres.

The marked decrease in circulating fibrinogen at the time when intracapillary thrombi are formed suggests that the "hyaline" thrombi of the generalized Schwartzman reaction are composed, in part, of fibrin.

There appears to be a relationship between the level of circulating fibrinogen at the time of injection of the endotoxin and the extent of the thrombosis. The higher the pre-injection fibrinogen level, the more extensive is the thrombosis. There is also a relationship between the amount of fibrinogen loss and the extent of thrombosis after the injection. The more extensive the thrombosis the greater is the post-injection decrease in circulating fibrinogen.

A comparison between the response of the haemostatic mechanism to tissue thromboplastin and bacterial endotoxin indicates that the latter acts in a unique manner and not by way of a simple "thromboplastic" activity.

From the haematological standpoint, "preparation" for the generalized Schwartzman reaction is accompanied by an increased circulat-

ing fibrinogen, leucocytosis, and thrombocytopenia.

II. Bacterial endotoxins *in vitro* are capable of shortening the coagulation time of normal whole blood, native platelet-rich and platelet-poor plasma, and the blood of a haemophilic patient in silicone but not in glass. The point in the coagulation system at which the endotoxins act was not found but the search was narrowed by the demonstration that these materials act independently of leucocytes and red blood cells, and do not act as reformed thromboplastin or thrombin. The shortening of the coagulation time *in vivo* 4 hours after endotoxin injection is probably through a different mechanism than *in vitro*.

SHAPIRO, S. S. & MCKAY, D. G. (1958). The prevention of the generalized Schwartzman reaction with sodium warfarin.—*J. exp. Med.* **107**, 377-381. [Authors' summary modified.] 3527

Using intravenous sodium warfarin, rabbits were rendered hypoprothrombinaemic and were given two i/v injections of Shear's polysaccharide. None of the 9 animals surviving the required period of time developed bilateral renal cortical necrosis or histologic thrombi in the kidney, liver, spleen, or lungs. In a control group of 7 animals treated only with endotoxin, 6 developed bilateral cortical necrosis. It was concluded that the prothrombin complex is necessary for the production of the generalized Schwartzman reaction by bacterial endotoxins and that this phenomenon is essentially a process of disseminated intravascular coagulation.

✓PIERACCI, F. & COLOSI, A. (1958). Micosi polmonare in equino: studio eziologico ed istopatologico. [*Mycotic bronchitis in a horse.*] — *Atti Soc. ital. Sci. vet., Rimini-Ravenna* 1957. **11**, 759-762. [Summaries in English and French.] 3528

Nodules, varying in size from that of a hazel nut to that of a large walnut, were detected in the lungs of an aged horse at meat inspection. They had a thin fibrous capsule containing a thick, creamy, brownish grey substance or a dirty white, gummy, mucoid material. Cultures were made on Sabouraud's medium and *Penicillium penicilloides* was obtained after two days' incubation. Culture suspensions were injected into the lungs of two g.pigs and a chicken, into the trachea of a chicken and into the air-sac of a chicken. The g.pigs died on the fifth day with a haemorrhagic serous liquid in the pleural cavities and opacity of the visceral pleura. The fowls were killed after



40 days; there were no P.M. findings. Apart from pneumonitis in a g.pig there were no histological changes in the experimental animals. The microscopic appearances of the lesions in the horse lung are described.—T.E.G.R.

GORDON, M. A. (1958). **Differentiation of yeasts by means of fluorescent antibody.**—*Proc. Soc. exp. Biol., N.Y.* **97**, 694-698. **3529**

The globulin fraction of antiserum produced in rabbits against *Candida albicans* was labelled with fluorescein isocyanate and applied as a differential stain to dried films from a wide range of yeasts. All 28 strains of *C. albicans* tested and all 8 strains of *C. tropicalis* were positive to the test, whereas other species of *Candida* and a variety of yeast-like organisms from 15 other genera gave negative or weak reactions. Preliminary studies showed that the method could be used to identify *C. albicans* in tissue sections or films of suspected material. Preliminary findings with the same technique applied to *Histoplasma capsulatum* and *Blastomyces dermatitidis* are also reported.

—E. G. WHITE.

✓ CORSICO, G. (1958). Istopatologia della mastite sperimentale da *Debaryomyces neoformans*. [Experimental *Cryptococcus neoformans* mastitis in cattle and goats.]—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957. **11**, 525-530. [Summaries in English and French.] **3530**

Mastitis was experimentally reproduced in 2 cows and 10 goats by intramammary inoculation of fungal cells. Local inflammation and severe involvement of the regional lymph nodes, appeared after five and 12 days respectively in the cows and after 7-16 days in the goats. The animals were slaughtered at varying intervals and a comparative study of the pathological changes was made. It is concluded that in the goat infection is less severe and the defence mechanism (which is stronger and more effective) comes into play earlier than in the cow.

—T.E.G.R.

✓ MONDINI, S., QUAGLIO, G. & VENTUROLI, M. (1958). Tracheobronchite micotica in una bovina con febbre catarrhale maligna. [Secondary mycotic infection in a cow with malignant catarrh.]—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957. **11**, 905-909. [Summaries in English and French.] **3531**

False membranes, firmly adherent to underlying tissues, were observed P.M. on the mucous membranes of the larynx, trachea and bronchi of a cow with malignant catarrh. These mem-

branes consisted of an opaque, uniform, yellowish white substance and were covered with a thin dry greyish green felt-like layer. Histological examination of the membranes revealed: an "internal zone", consisting mainly of interwoven hyphae and containing conidiophores which projected into the lumen; and a necrotic "intermediate zone". *Aspergillus fumigatus* was isolated from a mediastinal lymph node. The abundant surface growth of the fungus resembled the felt-like layer observed on the respiratory mucous membranes. Fungal elements were not demonstrable histologically in the lymph nodes examined. Cultural examination of lung tissue was not carried out. It is considered that the mycotic infection was secondary and that the extreme debility of the animal and prolonged antibiotic therapy favoured development of the fungus.—T.E.G.R.

✓ KAPLAN, W. & GUMP, R. H. (1958). **Ringworm in a dog caused by *Trichophyton rubrum*.**—*Vet. Med.* **53**, 139-142. **3532**

*Trichophyton rubrum* (*T. purpureum*) was isolated from a skin lesion in a year-old Boxer and from the feet of its owner. This is the second record of the isolation of this organism from a dog, and the first in the U.S.A. The owner is stated to have formed the habit of rubbing the dog with his bare feet during the evening!

—E. G. WHITE.

✓ KAFFKA, A. & RIETH, H. (1958). Laboratoriumstiere als Ursache einer Berufsdermatomykose und Massnahmen zur Verhütung weiterer Pilzinfektionen. [Laboratory animals as the source of dermatomycosis in a laboratory worker.]—*Zbl. Bakt. I. (Orig.)* **171**, 319-321. **3533**

*Trichophyton mentagrophytes* was isolated from skin lesions on the face, neck, arms and chest of a lab. assistant. 12 of 120 rabbits and 3 of 140 g.pigs had ringworm-like lesions and the fungus was isolated from 5 affected animals. Control measures were discussed.—R.M.

✓ BENEDEK, T. (1958). **Selective, chemical epilation in the treatment of tinea capitis as contrasted with the diffuse X-ray epilation.**—*Mycopathologia* **9**, 97-110. [In English. Summary in German.] **3534**

For some years the author has treated tinea capitis in children with a solution containing copper sulphate and chloral hydrate, which he terms a "chemical epilatory" since it penetrates and detaches the hairs infected with fungus and has no effect on uninfected hairs. Infected hairs can be readily detached after the solution has



been used for 2-3 days and the whole treatment lasts 2-4 weeks. Good results in a large epidemic in Toronto in 1951 are reported. The solution does not destroy the fungus but merely selectively loosens and detaches the infected hairs.

—E. G. WHITE.

AWAD, F. I. & KARIB, A. A. (1958). **Studies on bovine farcy (nocardiosis) among cattle in the Sudan.**—*Zbl. VetMed.* **5**, 265-272. [In English. Summaries in French, German and Spanish.] **3535**

Two types of cattle farcy occur in the Republic of the Sudan, a chronic granulomatous condition of the subcutis involving lymph vessels and nodes, sometimes with internal lesions, and a form in which only internal lesions are found and which may simulate tuberculosis. From both types of disease the authors isolated an aerobic acid-fast actinomycetes which they consider to be a member of the genus *Nocardia*, *A. farcinicus*, as described by Nocard (1888). Intraperitoneal inoculation into g.pigs caused death in 11-34 days, while subcutaneous inoculation caused a chronic discharging abscess.

—E. G. WHITE.

SOHLER, A., ROMANO, A. H. & NICKERSON, W. J. (1958). **Biochemistry of the Actinomycetales. III. Cell wall composition and the action of lysozyme upon cells and cell walls of the Actinomycetales.**—*J. Bact.* **75**, 283-290. [Authors' summary modified.] **3536**

The bacterial nature of the actinomycete cell wall was demonstrated by a number of criteria. In amino-acid and carbohydrate composition the walls of species of the genus *Nocardia* are very similar to the walls of corynebacteria.

LITTMAN, M. L. & PISANO, M. A. (1958). **Microbial growth stimulants in spleen.**—*Nature, Lond.* **181**, 285. **3537**

Ox spleen contained a factor which stimulated growth of a variety of micro-organisms in chemically-defined culture media, including *Candida albicans*, *Cryptococcus neoformans* and *Lactobacillus casei*. The factor resisted autoclaving at 121°C. for 15 min.; it was soluble in water, and alcohols but insoluble in ether, chloroform and pentane. Dried spleen remained active for at least a year when maintained in a desiccator at 5°C.—R.M.

WHITE, G. (1958). **Agar double diffusion precipitation reaction applied to the study of *Asterococcus mycoides*.**—*Nature, Lond.* **181**, 278-279. **3538**

In Kenya the agar double diffusion technique could be used for the diagnosis of bovine

contagious pleuropneumonia on specimens kept for up to 13 days at room temp. and on specimens preserved in 5% formaldehyde or 50% glycerin; the technique was therefore valuable for the examination of material received at the lab. in a partly decomposed state. Serum from immunized rabbits was used as antibody. The method described by Jennings & Malone [*J. Immunol.* **72**, 411 (1954)] had the advantage over Mansi's method [*V.B.* **28**, 445] that a positive reaction was visible after 2 hours and that there was more distinct separation of lines of precipitation as diffusion proceeded; but it had the disadvantage that larger amounts of reactants were required. It was intended to use the diffusion technique for studying the antigenic structure of the organism of bovine pleuropneumonia and its relationship to other P.P.L.O.—R.M.

BRION, A. & FONTAINE, M. (1958). **La maladie respiratoire chronique (MRC).** [**Chronic respiratory disease.**]—*Cah. Méd. vét.* **27**, 33-48. **3539**

This review article is in two chapters. The first, "General characters of chronic respiratory disease" (C.R.D.), deals with the epidemiology, symptoms, gross and microscopic lesions, and aetiology. The second, "C.R.D." caused by members of the group of pleuropneumonia-like organisms (P.P.L.O.), deals with: the bacteriological and cultural characters of the P.P.L.O.; diagnosis; aetiology (P.P.L.O. in relation to C.R.D.); treatment and control.—T.E.G.R.

YAMAMOTO, R. & ADLER, H. E. (1958). **Characterization of pleuropneumonia-like organisms of avian origin. I. Antigenic analysis of seven strains and their comparative pathogenicity for birds.**—*J. infect. Dis.* **102**, 143-152. [Authors' summary modified.] **3540**

Four distinct antigenic types were detected by a cross-agglutination test with the sera of rabbits hyperimmunized with the various strains. A comparison of the serological data with the pathogenicity for chickens and turkeys indicated that, with one possible exception, all of the pathogenic strains were antigenically related. The antigenic relationship of the mildly pathogenic N strain could not be conclusively determined. The two antigenic types represented by the SA and O strains were not pathogenic. The C strain, representing yet another type, was classified as mildly pathogenic. However, further cultural and serological work suggested that the original yolk inoculum of the C strain contained a second organism, antigenically related to the pathogenic Group I organisms.



Intraocular inoculation as described by Jung-herr *et al.* [see *V.B.* 25, 332] was used to detect differences in pathogenicity.

MUNCH-PETERSEN, E. & ARMSTRONG, J. (1958).

**The influence of orally administered oxytetracycline on the rumen bacteria of sheep.**—

*Aust. J. exp. Biol. med. Sci.* 36, 77-82. [Authors' summary modified.] 3541

Oxytetracycline was given by mouth at different dosage levels to 12 sheep. Their rumen

contents were compared before treatment and at P.M. examination. The pH of rumen liquid was considerably changed towards the acid range. The direct counts of rumen bacteria fell to about  $\frac{1}{2}$  to  $\frac{1}{3}$  of those found before treatment, but viable counts rose considerably. There was a great decrease in the numbers of organisms attached to fibres. The typical "rumen organisms" disappeared from the rumen contents with treatment and had not returned by the end of the experiment.

See also absts. 3805 (report, Gambia); 3806-3807 (report, Netherlands).

## DISEASES CAUSED BY PROTOZOAN PARASITES

ASHCROFT, M. T. (1958). **An attempt to isolate *Trypanosoma rhodesiense* from wild animals.**—*Trans. R. Soc. trop. Med. Hyg.* 52, 276-282. [Author's summary modified.] 3542

An attempt was made to isolate strains of polymorphic trypanosomes from wild animals in two areas of endemic *T. rhodesiense* sleeping sickness in Tanganyika by the subinoculation of blood into rats. One strain of polymorphic trypanosomes was isolated but it did not infect two human volunteers. Direct proof of the presence of *T. rhodesiense* in wild animals is, therefore, still lacking. Of 74 wild animals, 10 were infected with *T. brucei*, *T. congolense* or *T. vivax*. The probability is discussed that the true incidence is higher because cryptic infections can be missed.

WATSON, H. J. C. & WILLIAMSON, J. (1958).

**Suramin complexes. III. Preliminary experiments on *Trypanosoma simiae* infections in pigs.**—*Ann. trop. Med. Parasit.* 52, 72-81.

[Authors' summary modified.] 3543

In a pilot trial of drugs against *T. simiae* infection in pigs, the curative and prophylactic value of a wide range was investigated in pigs challenged by wild *Glossina morsitans*.

Preliminary experiments with infected splenectomized rabbits suggest that the rabbit is not a reliable guide to the therapeutic activity of a drug, and further work is needed.

The following drugs appear to be of no value in the treatment of *T. simiae* infection in pigs: ethidium bromide, cinnoline 528, mapharside, pentamidine, RD. 2902, and the suramin complexes of ethidium bromide and RD. 2902. Antrycide dimethylsulphate clears the blood for some weeks but does not effect cure.

The following drugs appear to effect cure in pigs: antrycide pro-salt, antrycide chloride at high dosage, and antrycide-suramin complex. Suramin also may be an effective curative agent,

but owing to an experimental error cure was not proven.

The following drugs, when given in large doses, appear to protect pigs from *T. simiae* infection for some six months: antrycide chloride and antrycide dimethylsulphate-suramin complex.

Among the small number of animals treated at various dose rates, neither antrycide chloride nor the suramin complex produced any severe local reaction or general symptoms of toxicity.

There is no evidence that trypanosomes readily become drug-fast to the antrycide-suramin complex, for three breaks-through were cured by re-treatment at the original dose. This may be true also of antrycide chloride, though only one break-through was similarly re-treated.

SENECA, H., SANG, J. B. & TROC, O. K. (1958).

**The electrophoretic pattern of the serum proteins in experimental haemoflagellate infections.**—*Trans. R. Soc. trop. Med. Hyg.* 52, 230-234. [Authors' summary modified.] 3544

The serum albumin is drastically reduced in experimental leishmaniasis and moderately reduced in experimental African and American trypanosomiasis. The serum  $\alpha$  globulins are markedly increased in leishmaniasis and moderately increased in trypanosomiasis. The serum  $\beta$  and  $\gamma$  globulins are reduced in leishmaniasis and increased in trypanosomiasis. Apparently *Leishmania donovani* is the most primitive member, the African trypanosomes the connecting link, and *Trypanosoma cruzi* the most advanced member of the haemoflagellates.

BUBE, F. W. (1958). Beiträge zum Nachweis und zur Behandlung der Kaninchencoccidiose.

[Diagnosis and treatment of coccidiosis in rabbits.]—*Zbl. Bakt. I. (Orig.)* 171, 363-371. [Summaries in English, French, Spanish and Russian.] 3545

A complement-fixation test was used to



supplement microscopical diagnosis. Antigen for the test was a centrifuged filtrate of incubated infected liver. Treatment with chloroquine phosphate was effective: 0.25 g. daily [? by mouth], total dose 9 g. The drug was of little prophylactic value.—R.M.

CLARKSON, M. J. (1958). **Life history and pathogenicity of *Eimeria adenoeides* Moore & Brown, 1951, in the turkey poult.**—*Parasitology* **48**, 70-88. [Author's summary modified.] **3546**

The life cycle and pathogenicity of a strain of *Eimeria* isolated in Gt. Britain from turkey poults by single cell inoculation are described and, using the criteria laid down by Tyzzer, the species is identified as *E. adenoeides*.

The life cycle is of the same general pattern as in other *Eimeria* species. The organism is highly pathogenic for young poults, a dose of 200,000 oocysts producing 100% mortality in 3-week-old birds and smaller doses causing reduced weight gain. Birds 11 weeks old resisted a dose of 3 million oocysts. The gross and microscopic pathology of the infection is described. No changes were found in the blood picture.

LANGUILLON, J. (1957). **Note sur deux parasites sanguicoles de mammifères du Cameroun. [Two blood parasites of mammals in the Cameroons.]**—*Bull. Soc. Pat. exot.* **50**, 362-363. **3547**

A note on protozoa, believed to belong to the genus *Babesia*, observed in erythrocytes of an elephant calf aged 3 months, and on a plasmodium observed in blood smears from porcupines (*Atherurus africanus*).—R.M.

SCHULZ, K. C. A. & SCHUTTE, J. R. (1957). **"Turning sickness." Bovine theileriosis in the Rustenburg district.**—*J. S. Afr. vet. med. Ass.* **28**, 279-289. **3548**

In South Africa "turning sickness" occurred sporadically and mainly between November and February. Diagnosis was based on the observation of schizonts resembling those of *Th. parva* in sections of brain from affected animals. One farm suffered heavy loss from this cause.

—R.M.

ALIEV, I. S. (1958). **[Attempt to control theileriosis in cattle.]**—*Veterinariya, Moscow* **35**, No. 3. pp. 27-28. [In Russian.] **3549**

The attempt was made on 18 collective farms in the Apsheron peninsula of Azerbaijan. Anti-tick measures comprised disinfection of farm buildings and yards and periodic treatment of cattle 1-3 times a month by arsenical or BHC

—creolin dips or dressings between March and October; and by dusting with BHC between November and February. Body temp. was measured daily during the disease season and any rise in temp. was promptly treated with caffeine and aminoacriquine. Treatment was controlled by blood smears and reinforced if necessary with penicillin and blood transfusions. In the first year of control 16% of all adult cattle developed *Th. annulata* infection compared with 63.5% the year before. Average milk yield increased from 1,196 to 1,487 litres. 2.4% of all cattle died from theileriosis compared with 28.4% the year before control was instituted.

—R.M.

I. SHMULEVICH, A. I. & EYPLOV, N. N. (1958). **[Treatment of *Theileria annulata* infection of cattle with berenil, terramycin and biomycin.]**—*Veterinariya, Moscow* **35**, No. 3 pp. 29-30. [In Russian.] **3550**

II. LAVRENT'EV, P. A. (1958). **[Gamma globulins in the specific prophylaxis and treatment of theileria infection in cattle.]**—*Ibid.* pp. 31-33. [In Russian. Summary in English.] **3551**

III. GONCHAROV, I. E., DANILOVA, V. M. & ZOLOTOVA, A. S. (1958). **[Use of vitamin B<sub>12</sub> in anaemia associated with theileria infection in cattle.]**—*Ibid.* pp. 34-38. [In Russian. Summary in English.] **3552**

IV. DUBOVUII, S. Z. (1958). **[Treatment of theileria infection in cattle with aminoacriquine in combination with trace elements and vitamin B<sub>12</sub>.]**—*Ibid.* pp. 38-41. [In Russian. Summary in English.] **3553**

I. The drugs were tested on cattle of the Latvian breed exposed to natural infection transmitted by *Hyalomma detritum*, and on calves experimentally infected by means of *Hyalomma* ticks. Treatment commenced on the first day of fever. "Berenil" was administered twice daily by i/m inj. at doses of 3.5 mg./kg. body wt., in some cases at 7 and 10 mg./kg. Oxytetracycline was administered i/v at 15 mg./kg. in 100-150 ml. water. The sodium salt of biomycin (chlortetracycline) was administered i/v at 3 mg./kg. as a 1 or 2% soln. In addition to chemotherapy each animal was given injections of 20 mg. CoCl<sub>2</sub> and 0.5 mg. CuSO<sub>4</sub> daily and a vitamin preparation containing 50 µg. of B<sub>12</sub> and vitamins B<sub>1</sub> and C; also cardiac stimulants and laxatives when required. The proportion of recoveries following treatment was as follows. With "Berenil" alone or plus quinuronium 6 of 12 recovered; with biomycin plus quinuronium 26 of 29 recovered; with biomycin plus "Berenil" 9 of 9 recovered; with oxytetracycline 20 of 23



recovered; with oxytetracycline plus "Berenil" 2 of 2 recovered. It was concluded that the tetracycline antibiotics could be recommended for the treatment of *Th. annulata* infection.

II. L. reported small-scale experiments which indicated that gammaglobulin prepared from sera from cattle hyperimmunized against or infected with theileria was of therapeutic value. It was administered in 2 or 3 doses each of 0.3–0.5 ml./kg. body wt. and all 7 treated animals recovered. It apparently required serum from 19 oxen to provide the necessary globulin.

III. Good results were claimed for therapy with vitamin B<sub>12</sub> in cows which were anaemic after recovering from theileria infection. A soln. containing 80 µg. active preparation/ml. was used and a single s/c inj. of 1–1.5 ml. was given. Details of 2 cases are given.

IV. Aminoacriquine was administered i/v at 0.003 g./kg. in one dose, repeated after 2–3 days if necessary. A soln. composed of 10% sodium bromide soln. and 1% procaine soln. was administered i/v on the day after the first treatment with aminoacriquine, and repeated after 24 hours; the dosage was 25–30 ml./kg. Small doses of caffeine were given to stimulate the circulatory system, and also vitamin B<sub>12</sub>, CoCl<sub>2</sub> and CuSO<sub>4</sub>, plus good feeding. 23 of 24 cases so treated recovered.—R.M.

NEITZ, W. O. (1958). **Corridor disease.**—*Bull. epiz. Dis. Afr.* 6, 65. [In French p. 105.] 3554

N. succeeded in transmitting *Gonderia lawrenci* from ox to ox by means of *Rhipicephalus appendiculatus* adult ticks which had fed in the preceding stage on a splenectomized animal which had recovered from the disease. It was now clear that cattle served as reservoirs of *G. lawrenci*. Diseases referred to as theileriosis of Southern Rhodesia, corridor disease, syn-cerine gonderiosis, Rhodesian malignant bovine gonderiosis, January disease, and buffalo disease were all forms of *G. lawrenci* infection.—R.M.

WINTER, H. (1958). **Pathological study of a case of canine toxoplasmosis.**—*Aust. vet. J.* 34, 179–185. [Author's summary modified.] 3555

In a dog which died from toxoplasmosis the most prominent lesions were coagulation necrosis in the stomach, pancreas, lung and lymph nodes, with little inflammatory reaction and secondly, atrophy of the lymphatic tissue. The probability was discussed that in the progressive form of the disease, a toxic substance might be produced by the parasite which inhibits multiplication of cells and shows negative chemotactic activities.

Attention was drawn to the necessity of detailed examinations especially of the haemopoietic system.

PRIDHAM, T. J. & BELCHER, J. (1958). **Toxoplasmosis in mink.**—*Canad. J. comp. Med.* 22, 99–106. 3556

Investigation of two outbreaks of disease affecting several mink ranches revealed the presence of toxoplasmosis. Diagnosis was made by histopathological and serological methods and by isolation of the organism in mice. The source of infection was not determined but contaminated food was suspected. Sulphonamides and sulphones were used in treatment and appeared effective.—A. S. GREIG.

GOLDMAN, M., CARVER, R. K. & SULZER, A. J. (1958). **Reproduction of *Toxoplasma gondii* by internal budding.**—*J. Parasit.* 44, 161–171. [Authors' summary modified.] 3557

*T. gondii* from peritoneal exudate of infected mice was studied in smears stained with silver protein. Evidence is presented that in such material this species reproduces by a process of internal budding which the authors named endodyogeny. In this process, each parent cell produces 2 daughter cells which develop internally. Upon reaching full growth, the joined daughter cells are freed from the parent cell, destroying the latter in the process. Separation of daughter cells then takes place. Changes in the nucleus and associated cytoplasmic structures are described and illustrated.

DISSANAIKE, A. S. (1958). **Experimental infection of tapeworms and oribatid mites with *Nosema helminthorum*.**—*Exp. Parasit.* 7, 306–318. [Author's summary modified.] 3558

*Hymenolepis nana* of mice and rats was successfully infected with *N. helminthorum*. The microsporidian showed all the stages of development in this cestode as in naturally infected *Moniezia*. The spores were smaller, however, and the cycle was probably shorter. *Taenia saginata* in a human patient was experimentally infected with this microsporidian, but only early developmental stages were seen. Two oribatid mites, *Ceratoppia bipilis* and *Xenillus tegeocranus* were also infected. The spores developed in the midgut and caeca and were much smaller than those in *H. nana*. Although the cuticle-penetrating stages of this parasite could not be demonstrated, there is little doubt that in the experimentally infected worms as well as in naturally infected *Moniezia* the sporoplasm enters the host tissues through the cuticle.



MOULD, D. L. & THOMAS, G. J. (1958). The enzymic degradation of starch by holotrich protozoa from sheep rumen.—*Biochem. J.* **69**, 327-337. [Authors' summary modified.] **3559**

The action of R-enzyme,  $\alpha$ -amylase and  $\beta$ -amylase on starch stored by holotrich ciliates from the sheep rumen verified that this starch is amylopectin.

See also abst. 3805 (report, Gambia).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

GEIGER, W. & OTTE, B. (1958). Die Stellung der Pansenveränderungen in der Pathogenese der Maul- und Klauenseuche des Rindes. [Role of rumen lesions in pathogenesis of foot and mouth disease.]—*Zbl. VetMed.* **5**, 431-442. [Summaries in English, French and Spanish. English summary modified.] **3560**

Attempts were made to confine entry of the virus to the rumen by administering it by stomach tube. The results failed to answer the question whether the rumen lesions in F. & M. disease represent a local infection or a manifestation of generalization. From the general picture it was concluded, however, that lesions in the rumen are of local origin when they occur alone or together with only slight lesions in the mouth.

STORZ, H. (1958). Über das Verhalten des Virus der Maul- und Klauenseuche beim Einfrieren und Auftauen in Gegenwart verschiedener Medien. [The behaviour of the virus of foot and mouth disease during freezing and thawing in various media.]—*Zbl. VetMed.* **5**, 405-430. [Summaries in English, French and Spanish. English summary modified.] **3561**

The behaviour of F. & M. disease virus from the musculature of unweaned mice was studied during freezing at  $-20^{\circ}$  and  $-60^{\circ}\text{C.}$ , and thawing at  $4^{\circ}\text{C.}$  in the refrigerator, at  $20^{\circ}\text{C.}$  room temp., and at  $37^{\circ}\text{C.}$  in a water-bath. Various media, including buffer systems of weakly acid, neutral and weakly alkaline reaction were used. Damage to the virus did not depend on the rate or temp. of freezing and thawing. Freezing experiments with virus gave favourable results at pH 8.0, but no significant influence of pH was seen in the range 7.0 to 9.0. Phosphate, borate, borax potassium biphosphate, and boric acid soda buffers were acid in reaction when frozen, and therefore unsatisfactory. The extent of damage to the virus varied widely with the different media. Loss of virus was greatest with the buffers mentioned above and with distilled water, and less with bovine

A comparison was made of various enzyme activities present in aqueous extracts of purified preparations of the single organisms *Isotricha* and *Dasytricha*.

In the presence of 15% maltotriose, holotrich  $\alpha$ -amylase is inhibited but phosphorylase activity is unaffected. Holotrich starch is synthesized by the phosphorolytic mechanism common to plants and animals.

amniotic fluid. In contrast, glycoll buffer, isotonic phosphate buffer and Ringer-Locke-Tris solution caused no damage to the virus after a single freezing, but did damage it when the process was repeated 10-15 times. Increasing the viscosity of buffered and unbuffered solutions had a protective effect on the virus. Solutions with a viscosity of 0.95 centipoise and less were without exception unsuited for freezing experiments with this virus. When the viscosity of the media was above 1.7 centipoise there was no damage to the virus even when buffer was omitted. The addition of saccharose to media produced a very striking increase in viscosity and protective effect on the virus.

PARAF, A., ASSO, J. & VERGE, J. (1958). Modification de la virulence d'une souche de virus aphteux par passages successifs sur le lapin. [Modification of the virulence of a strain of foot and mouth disease virus by consecutive passage in rabbits.]—*C. R. Acad. Sci., Paris* **246**, 3698-3701. **3562**

After 90 passages in new-born rabbits, then in young rabbits, virus of Type C was adapted to rabbits aged 35 days, which died 3-4 days after infection. The adapted virus was no longer virulent for cattle.—R.M.

FAYET, M.-T. & PONCET, G. (1958). Immuno-électrophorèse appliquée au virus aphteux. [Immuno-electrophoresis applied to foot and mouth disease virus.]—*Ann. Inst. Pasteur* **94**, 732-738. [English summary modified.] **3563**

Immuno-electrophoresis of F. & M. disease virus induces the formation of one or two precipitin lines, which correspond to constituents possessing the same mobility as beta-globulins. The authors suggested that these lines correspond to two constituents: one infectious and complement-fixing (large component), the other complement-fixing (small component).

LUCAM, F., MACKOWIAK, C. & MAGAT, A. (1958). La vaccination anti-aphteuse en



France. Étude statistique de ses résultats. [A statistical study of the results of vaccination against foot and mouth disease in France.]—*Bull. Off. int. Epiz.* **49**, 230-256. **3564**

From 1st April–31st December, 1956, the number of outbreaks of foot and mouth disease increased from 150 to about 6,500 and of infected departments from 46 to 79. Only vaccination around new outbreaks is considered here. Trivalent vaccine was used s/c and results were observed up to 150 days after vaccination. In 69 departments 1,517,860 animals (999,247 cattle, 278,913 pigs and 239,700 sheep and goats) on 76,690 farms were vaccinated. During the following five months 76,176 farms (i.e., 99.36%) remained free from infection while outbreaks occurred on 496 (during the first 20 days in 195 cases and between the 21st and 150th days in the other 301). Of these breakdowns 86.07% occurred in three departments and the vaccines concerned were from batches also used in other departments where no breakdowns occurred. The hypotheses of virulence and of inefficacy of the vaccines are ruled out and, in the light of the geographical incidence of the breakdowns, it is concluded that unknown local factors played a part in lowering the immunizing properties of the vaccine.—T.E.G.R.

KOBUSIEWICZ, T. & SZKILNIK, S. (1957). I. Chinozolowa szczepionka przeciwpryszczycowa produkcji zakładu pryszczycy I.W. [A quinosol-inactivated foot and mouth disease vaccine.]—*Roczn. Nauk rol.* **68**, Ser. E. 163-171. [In Polish. Summaries in English and Russian.] **3565**

The vaccine is simple to make and consists of 3% fine suspension of unfiltered particles of F. & M. disease vesicles; the virus is adsorbed on aluminium hydroxide and inactivated by 0.5% quinosol. The addition of 20% glycerin enables storage for 30 days at room temp. (17° to 20°C.). An effective immunizing dose is 5 ml. for animals up to 300 kg.; it is injected s/c in the neck region. Further tests are being carried out.—M. GITTER.

MUSSGAY, M. (1958). Untersuchungen mit fluoreszierenden Antikörpern über die Bildung von spezifischem Antigen des Virus der Maul- und Klauenseuche in Gewebekulturzellen. [Studies using fluorescent antibody on the formation of specific antigen of foot and mouth disease virus in tissue culture cells.]—*Zbl. Bakt. I. (Orig.)* **171**, 413-423. [Summaries in English, French, Spanish and Russian. English summary modified.] **3566**

C<sub>1</sub>-strain of F. & M. disease virus and

tissue cultures of calf kidney cells were used. Four hours after infection specific antigen was present in the cytoplasm of the cells. During virus multiplication the cells shrank and became rounded. They became completely fluorescent except for a strongly basophilic inclusion at the site of the nucleus. There was a relationship between the intensity of the fluorescence and the basophilic staining of the cytoplasm and nucleus.

MCCLAIN, M. E. & HACKETT, A. J. (1958). A comparative study of the growth of vesicular stomatitis virus in five tissue culture systems. —*J. Immunol.* **80**, 356-361. [Authors' summary modified.] **3567**

Some properties of the growth of vesicular stomatitis virus in 5 tissue culture systems have been described. Both types of the virus grow best in chick fibroblast monolayers, and poorest in L cell cultures. Nevertheless, L cells were as susceptible to this virus as chick fibroblasts when used for plaque assays. No differences were found between the 2 isolates studied which were of sufficient magnitude to serve as genetic markers.

TERPSTRA, J. I. (1958). De ziekte van Aujeszky bij varkens. [Aujeszky's disease in pigs.]—*Tijdschr. Diergeneesk.* **83**, 431-436. [In Dutch. Summaries in English, French and German.] **3568**

Stillbirth of piglets was one of the features of an outbreak involving one farm.—R.M.

CHADLI, A. (1958). Recrudescence de la rage en Tunisie. [Recrudescence of rabies in Tunisia.]—*Arch. Inst. Pasteur Tunis* **35**, 61-64. **3569**

Tabulated details are given of 188 examinations for Negri bodies from 1st January 1955 to 28th February 1958. Of these specimens 167 were from dogs, 14 from cats and 7 from other animals. Negri bodies were demonstrated in 88 dogs and 3 cats. There was an increase in the last quarter of 1957 with 12 of 18 specimens from dogs positive. In the first two months of 1958, specimens from 31 dogs were examined, 25 being positive. Comprehensive measures envisaged by legislation for the control of rabies in dogs are enumerated; however, the impression is conveyed that they are not strictly enforced.—T.E.G.R.

CONSTANTINESCO, N. & BIRZU, N. (1958). Phénomène d'autostérilisation et guérison dans la rage expérimentale. [Autosterilization and recovery in experimental rabies.]—*Ann.*



*Inst. Pasteur* 94, 739-747. [English summary modified.] **3570**

Immunization can lengthen the incubation period and the duration of rabies in mice after intracerebral challenge. In this case, the central nervous system is almost always autosterilized.

The autosterilization process may sometimes result in a "cured paralytic rabies," characterized by durable neuro-muscular sequelae, with functional impotence, as in poliomyelitis.

The paralytic syndrome in animals, the c.n.s. of which has become avirulent, differs from allergic demyelination, resulting from antirabic treatment.

In partially immunized animals rabies generally behaves like any other autosterilizable, neurotropic, curable disease, (e.g. encephalitis and poliomyelitis).

NUÑEZ, F. C. & ECHEGARAY, A. V. (1957). Desarrollo y produccion en Mexico de la vacuna avianizada para el control del derriengue. [Production in Mexico of avianized vaccine against paralytic rabies in cattle.] — *Bol. Ofic. sanit. pan-amer.* 43, 251-259. **3571**

An avianized glycerine phosphate vaccine against paralytic rabies in cattle was prepared from Flury strain virus, maintained by alternate passages in chick embryos and young mice. Twenty cattle 16 months old were vaccinated s/c with doses of 10 ml. and resisted subsequent challenge with virulent virus. A total of 1,427,455 doses were produced during 1950-55 and used with good results in a national campaign for the eradication of paralytic rabies in cattle.—E.G.

FENNER, F. & COMBEN, B. M. (1958). Genetic studies with mammalian poxviruses. I. Demonstration of recombination between two strains of vaccinia virus.—*Virology* 5, 530-548. [Authors' summary modified.] **3572**

Two strains of vaccinia virus were selected which differed in 5 characters: pock morphology, haemagglutinin formation, heat resistance, mouse neuropathogenicity, and production of skin lesions in the rabbit. Of 149 single pocks obtained after mixed infection of cells of the chorioallantois or HeLa cell cultures about one-third were of one parental pock type (red) and two-thirds of the other parental pock type (white). Seventeen clones, all white pocks, showed a variety of combinations of the characters of the two parental strains; the other 132 were of the appropriate parental genotype. None of the clones with novel genotype yielded either

parental strain on passage, but 11 were stable and 6 unstable. It is considered that they arose by genetic recombination. Haemagglutinin formation and heat resistance were all-or-none characters; no intermediates were found. The reactions of mice and rabbits to infection with the recombinants either resembled those of the less virulent parent, or were intermediate. Changes in virulence for mice and for rabbits were not correlated.

I. SCHÜRMANN, E. (1958). Hühnerpocken- oder Taubenpockenvaccine als Impfstoff gegen Hühnerpockendiphtheroid? [The choice of fowl pox or pigeon pox virus vaccine for immunizing fowls.] — *Dtsch. tierärztl. Wschr.* 65, 242-244. **3573**

II. GERRIETS, E. (1958). Aktive Immunisierung gegen Pocken-Diphtheroid des Huhnes mit Taubenpocken- oder Hühnerpockenvaccinen? [The choice of fowl pox or pigeon pox virus vaccine for immunizing fowls.] — *Ibid.* 244-246. **3574**

I. In the opinion of S., pigeon pox virus should be used for immunizing laying hens while all other birds should be immunized with egg-adapted fowl pox virus, because the latter generally gives a life-long immunity and the needle method of inoculation was quicker than the follicle method used for pigeon pox virus.

II. G. defended his previous assertion [*Dtsch. tierärztl. Wschr.* 64, 480 (1957)] that the use of fowl pox vaccine should be banned because it led to the introduction of fowl pox into a flock.—R.M.

FENNER, F. (1958). The biological characters of several strains of vaccinia, cowpox and rabbitpox viruses. — *Virology* 5, 502-529. [Author's summary modified.] **3575**

Several biological characters of 24 different strains of vaccinia, cow pox, and rabbit pox viruses were compared, to provide a basis for genetic studies of the mammalian pox viruses. Reproducible differences occurred in the response of experimental animals (chick embryos, mice, and rabbits) to infection with comparable doses of different strains, and differences were also demonstrated in the production of haemagglutinin and resistance to heat.

VERSTEEG, J., MOUTON, R. P. & VERLINDE, J. D. (1958). Aziatische influenza bij paarden? [Suspected Asian influenza in horses.] — *Tijdschr. Diergeneesk.* 83, 608-613. [In Dutch. Summaries in English, French and German. English summary modified.] **3576**

The haemagglutination-inhibition reaction



with the Asian type of influenza A virus was positive in 10 of 27 horse sera collected in September and in 11 of 52 horse sera collected in October 1957. A repeated examination of 15 sera yielded a positive result in 3 samples collected in September/October 1957 and in 1 of those collected in January 1958; the former 3 had become negative, while the latter, which was previously negative, had become positive. Six of the sera were also examined in the mouse protection test. The results of the haemagglutination-inhibition reaction are correlated with those of the mouse protection test. Antibodies failed to develop in a horse following intratracheal inoculation of an egg-adapted Asian virus. Intratracheal inoculation of a mouse-adapted strain, however, resulted in the development of both haemagglutination-inhibiting and neutralizing antibodies. The results indicate that the antibodies are specific and that horses may apparently be infected by natural exposure. No antibodies were demonstrable in 124 pig sera examined.

SOVINOVA, O. & LUDVÍK, J. (1958). Electron-optická studie viru A-equi-Praha/56. [*Electron microscopy of the virus A-equi Praha/56.*] — *Čsl. Epidem. Mikrobiol. Imunol.* **7**, 6-8. [Summaries in English and Russian.] **3577**

Virus A-equi-Praha/56, isolated from horses with a mild respiratory disease, was studied electron microscopically and serologically. It appeared to belong to the influenza group and was antigenically related to human influenza type A virus.—E.G.

BENDA, R. (1958). Experimentální přenos čs. klíšťové encefalitidy na kozy sáním nakažených samiček obecného klíštěte *Ixodes ricinus* L. [*Experimental transmission of Czechoslovak tick encephalitis to goats by infected female Ixodes ricinus.*] — *Čsl. Epidem. Mikrobiol. Imunol.* **7**, 1-5. [In Czech. Summaries in English and Russian.] **3578**

An atypical infection with temporary increases in temp., viraemia and virus excretion in milk was produced in goats on which female *Ixodes ricinus*, experimentally infected with the virus of Czechoslovak tick-borne encephalitis had been allowed to feed. Transmission by s/c inj. of virus produced similar symptoms, but later than after infection by ticks. Antibodies were demonstrable during the third week after infection. In immune animals the only reaction to infection was an increase in the antibody titre.—E.G.

MÁLKOVÁ, D. & RATHOVÁ, V. (1958). Výběr kmenů viru klíšťové encefalitidy k přípravě vakciny. [*Selection of tick-borne encephalitis virus strains for vaccine production.*] — *Čsl. Epidem. Mikrobiol. Imunol.* **7**, 78-84. [In Czech. Summaries in English and Russian.] **3579**

Antigenic and immunogenic relationship was demonstrated in three indigenous Czechoslovak tick-borne encephalitis virus strains, one Far-Eastern strain, one biphasic meningoencephalitis virus and one louping-ill virus. These viruses were differentiated by complement fixation from those of Japanese B encephalitis, St. Louis encephalitis, Western type equine encephalomyelitis, lymphocytic choriomeningitis and murine encephalomyelitis.—E.G.

BÁRDOŠ, V. (1958). Vírusové neuroinfekce přírodním s ohniskovým výskytem na východnom Slovensku. [*Neurotropic virus infections in Eastern Slovakia.*] — *Čsl. Epidem. Mikrobiol. Imunol.* **7**, 163-170. [In Slovak.] **3580**

In Eastern Slovakia, four strains of lymphocytic choriomeningitis virus were isolated from mice. Of 28 bovine serum samples 13 contained antibodies against Eastern and 7 against Western equine encephalomyelitis. Columbia SK virus antibodies of the encephalomyocarditis group were present in one horse serum sample. Tick-borne encephalitis, lymphocytic choriomeningitis and equine encephalomyelitis occurred sporadically in the local population.—E.G.

HALE, J. H., LIM, K. A. & COLLESS, D. H. (1957). Investigation of domestic pigs as a potential reservoir of Japanese B encephalitis virus on Singapore Island. — *Ann. trop. Med. Parasit.* **51**, 374-379. [Authors' summary modified.] **3581**

Following subcutaneous inoculation of 500–5,000 intracerebral mouse LD<sub>50</sub> doses of Japanese B encephalitis virus, pigs on Singapore Island develop a low-grade viraemia that may last for 24–48 hours.

Viraemia following such doses is seen only in animals below the age of eight months. In no instance was there any overt illness.

When infected *Culex tritaeniorhynchus* mosquitoes fed on young piglets, the animals developed a low-grade viraemia.

Although the viraemia in these experiments was of a low order, a *C. tritaeniorhynchus* mosquito became infected after taking a blood-meal.

Evidence is produced that the majority of pigs on the Island have neutralizing antibodies to Japanese B virus, presumably as the result



of infection; 7%, however, are antibody-free, and a proportion of the young pigs born will therefore always be susceptible to infection. It is concluded that pigs may be a potential reservoir of Japanese B virus in the area.

BANTA, J. E. (1958). **Cultivation of dengue, Western equine encephalomyelitis, Japanese encephalitis and West Nile viruses in selected mammalian cell cultures.**—*Amer. J. Hyg.* **67**, 286-299. [Abst. from author's summary.] **3582**

It was demonstrated that these agents can be successfully propagated in various cell cultures. The cultures employed were: HeLa strain, human conjunctival strain, human intestinal strain, human skin strain, and monkey-kidney epithelium.

BENDA, R. & DANEŠ, L. (1958). K možnosti přežívání viru severoamerické encefalomyelitidy koní západního typu v klišeti *Ixodes ricinus* L. [Survival of Western equine encephalomyelitis virus in *Ixodes ricinus*.]—*Čsl. Epidem. Mikrobiol. Imunol.* **7**, 102-105. [In Czech. Summaries in English and Russian.] **3583**

Western equine encephalomyelitis virus did not persist in infected *Ixodes ricinus* for longer than 3-4 weeks, irrespective of the developmental stage of the ticks. Neither was the virus present in ova of infected females.—E.G.

KRAUSS, S., JASTRZEBSKI, T. & WAWRZKIEWICZ, J. (1957). **Attempts to diagnose equine infectious anaemia by means of agglutination of bacteria coated with horse serum containing equine infectious anaemia virus.**—*Biul. Inst. Wet. Pulawy* **1**, 75-78. [In English.] **3584**

The method described by Roberts & Jones [V.B. **12**, p. 416] was applied to equine infectious anaemia by "coating" *Serratia marcescens* or proteus OX 19 with virus present in serum from an infected horse. Normal horse serum agglutinated the coated bacteria, but the titre was slightly lower than that of agglutination by serum from infected horses. Hyperimmunization of rabbits by inoculations of bacteria "coated" with virus resulted in the production of antibodies which could be detected by the agglutination of coated *S. marcescens*. The work reported was of a preliminary nature, and the results were considered to justify further study of the test.—R.M.

TRYLICH, C. (1958). **A simple chemical test for use as an aid in the diagnosis of swamp fever.**—*Canad. J. comp. Med.* **22**, 67-68. **3585**

At present, diagnosis of swamp fever (equine infectious anaemia) is difficult and reliance must be placed on clinical observations of suspect horses at frequent intervals. At various times efforts have been directed to some simple supplementary method for application in the field or laboratory to assist in a rapid and confirmatory diagnosis of the disease.

T. describes a simple chemical test found of practical value in field studies in Europe; it is designed to detect the increase in serum lipids which apparently occurs as one of the frequent pathological signs of infectious anaemia.

—R. V. L. WALKER.

FORTNER, J. (1958). Voyage au Japon pour l'étude des épizooties et, en particulier, de l'anémie infectieuse des équidés. [Infectious anaemia of horses in Japan.]—*Bull. Off. int. Epiz.* **49**, 214-229. **3586**

F. made a survey of infectious diseases of animals in Japan, with special reference to equine infectious anaemia. This disease is notifiable and the slaughter-compensation policy is one of the measures adopted for its control. An annual survey of all horses is held and a medical chart is kept for each horse. Great reliance, for diagnostic purposes, is placed on the demonstration of siderocytes in the blood; a horse whose siderocyte count is more than 1/100,000 w.b.c. is suspect and a second blood examination is made after four weeks. Liver biopsy is frequently resorted to for confirmation. It is considered that regular temperature taking is necessary for the detection of chronic cases, which are likely to be missed by the siderocyte count alone. Current research work, in Japan, on the serological diagnosis of the disease is briefly reviewed.

—T.E.G.R.

RECEVEUR, R. (1957). Risques de dispersion de la peste bovine par les viandes fraîches ou congelées provenant des pays contaminés? [Spread of rinderpest by means of fresh or frozen meat.]—*Bull. Off. int. Epiz.* **48**, 148-158. [Summary in English.] **3587**

At temperatures of 25°C. or above, rinderpest virus will not persist in the flesh or organs for longer than ten days. At temperatures below 0°C. it will persist in the flesh for several months, and in the spleen and blood preserved at temperatures between -20° and -30°C. living virus has been demonstrated in the spleen after three months and in the blood after five months. In spite of the theoretical possibility that rinderpest might be introduced into a country through the agency of refrigerated meat or offals of animals slaughtered while affected with the disease, outbreaks in new countries



have always been due to the introduction of living affected animals and in no case to infected meat or organs. The importation of meat from countries in which rinderpest exists can, it is suggested, be undertaken without risk provided certain precautions are observed.

—H. THORNTON.

I. FURUTANI, T., KATAOKA, T., KURATA, K. & NAKAMURA, H. (1957). [Studies on the AKO strain of lapinized-avianized rinderpest virus. I. Avianization of lapinized rinderpest virus.]

—*Bull. Nat. Inst. Anim. Hlth, Tokyo* No. 32. pp. 117-133. [In Japanese. Abst. from English summary pp. 134-135.] **3588**

II. FURUTANI, T., ISHII, S., KURATA, K. & NAKAMURA, H. (1957). [Studies on the AKO strain of lapinized-avianized rinderpest virus. II. Features of multiplication of the virus in embryonating hen eggs.]—*Ibid.* pp. 137-147. [In Japanese. Abst. from English summary pp. 148-149.] **3589**

I. The AKO strain of rinderpest virus was derived from the Nakamura III strain by about 29 alternate passages in chick embryos and rabbits, followed by 129 serial passages through chick embryos by i/v inoculation. In rabbits and cattle it had similar biological and immunological properties to those of the Tachikawa strain of lapinized-avianized virus: cattle developed only a slight fever after inoculation and subsequent immunity was good.

II. Attempts were made to utilize chick embryos for vaccine production. Of various methods, intravenous inoculation of embryos aged 13 days gave a high yield of virus in the shortest time (5 days).—R.M.

GREIG, A. S., BANNISTER, G. L., MITCHELL, D. & BARKER, C. A. V. (1958). Cultivation in tissue culture of an infectious agent from coital exanthema of cattle. A preliminary report.—*Canad. J. comp. Med.* **22**, 119-122. **3590**

Coital exanthema is of common occurrence in European countries, but has been reported only sporadically in North America. From an outbreak in Ontario, vaginal discharge material was studied at the Animal Diseases Research Institute, Hull, Quebec.

From tissue culture passages of the original specimen, an agent with cytopathogenic properties for both bovine embryo skin and bovine embryo kidney cortex was recovered. This agent, after six tissue culture passages, proved capable of producing the infection in heifers. No visible micro-organisms were found after microscopic examination of stained films of the tissue culture

cells and sterility tests of infective tissue culture fluids failed to reveal bacterial growth. These limited observations tend to concur with the belief that a virus is involved.

Neutralizing antibodies have never been detected in the sera of infected or recovered animals. The suggestion is offered that an antigenic response is not recognized because the infection is local and no invasion of the bloodstream occurs.

Since permanent disability following infection is rarely noted, this condition has not been studied intensively. Infection may interfere with the normal breeding programme in infected herds, and further investigations are being conducted.—R. V. L. WALKER.

BOURDIN, P., BUCK, G. & JACOTOT, H. (1958).

La vaccination contre la paralysie contagieuse du porc à Madagascar. [Immunization in control of Teschen disease in Madagascar.]—*Rev. Elev.* **11**, 17-22. [Summaries in English and Spanish.] **3591**

A phenolized vaccine adsorbed on aluminium gel was prepared from brain tissue of young pigs inoculated intracerebrally and killed at the height of the paralytic and thermal syndrome. The vaccine was administered to 112,234 pigs aged 2-3 months in 2 s/c doses of 5 ml. at 15 days' interval. Of these, 1,462 (1.3%) contracted the disease. The virus was also grown in tissue culture on monocellular layers of pig kidney cells and an aluminium gel vaccine was prepared. Preliminary tests gave satisfactory results and it is hoped that it will be possible to produce sufficient vaccine for the control of the disease.—T.E.G.R.

PATOČKA, F., KUBELKA, V. & KORYCH, B. (1958). Pokus o modelovou imunisaci vepřů proti Těšínské chorobě formolisovaným virem z tkáňových kultur. [Model immunization experiment in pigs against Teschen disease with formalized virus from tissue culture.]—*Čsl. Epidem. Mikrobiol. Imunol.* **7**, 73-77. [In Czech. Summaries in English and Russian.] **3592**

Virulent porcine encephalomyelitis virus was grown on homologous embryonic tissue and inactivated by formalin at 37°C. The vaccine was proved harmless by intracerebral and intranasal application.

Eight pigs were immunized by two i/m doses of 2 ml. each, at an interval of 3 weeks. The first dose was given with, the second without an adjuvant. Challenged 6 weeks later by 400 LD<sub>50</sub> intranasally, four of the pigs died, after an incubation period of 10-16 days. Possi-



bilities of improving the vaccine by using a less virulent but more immunogenic virus strain were discussed.—E.G.

MARSHALL, I. D. & FENNER, F. (1958). **Studies in the epidemiology of infectious myxomatosis of rabbits. V. Changes in the innate resistance of Australian wild rabbits exposed to myxomatosis.**—*J. Hyg., Camb.* **56**, 288-302. [Authors' summary modified.] **3593**

Annually for four years groups of young rabbits have been captured during non-epizootic periods from areas in which myxomatosis has occurred during the previous summer. The intensity of the preceding epizootic was measured by testing a sample of survivors for antibody. The captured young rabbits were reared in the laboratory until they were about four months old and then inoculated intradermally with small doses of a slightly attenuated myxoma virus strain, all samples of virus being derived from the same batch which has been stored at  $-70^{\circ}\text{C}$ . There was a significant negative correlation between the mortality rate and the degree of exposure of the forbears. Passive and active immunization have been excluded and this result is ascribed to increased genetic resistance.

PASLEY, F. & AUER, J. (1958). **Morphological evidence of endocrine dysfunction due to Newcastle disease virus.**—*Canad. J. comp. Med.* **22**, 44-55. [Summary in French.] **3594**

The ovaries and pituitary glands of chickens infected with Newcastle disease virus were examined histologically and biochemically. Histologically the pituitary glands showed degeneration of acidophile and basophile cells, but no inflammation. Recovery was evident within three to five weeks. During active infection the acidophiles showed increased acid phosphatase activity. These changes were considered to be the result of ovarian and general infection rather than primary pituitary inflammation. Histologically the ovaries showed oedema, degeneration of the follicles, inflammatory cells, and stromal vacuolization in some areas but were normal in other areas. Cessation of ovulation was probably the result of general debility combined with oophoritis.—A. S. GREIG.

BOWER, R. K. (1958). **Studies on Newcastle disease virus by the plaque method.**—*J. Bact.* **75**, 496-498. [Author's summary modified.] **3595**

Several strains of Newcastle disease virus were assayed by the plaque method. They all formed similar clear plaques about 4 to 5 mm.

in diameter after 5 days of development. Plaque titres expressed as plaque-producing particles per ml. were about 1 log. less than embryonated egg titres expressed as LD<sub>50</sub> units per ml. This discrepancy was discussed.

LUCAS, A. & LAROCHE, M. (1958). La maladie de Newcastle chez la perdrix. (Pseudo-peste aviaire.) [Newcastle disease in partridges.]—*Rec. Méd. vét.* **134**, 162-165. [Summary in English.] **3596**

In the partridge there are no characteristic symptoms apart from those of a general infection, which may be acute or chronic. Symptoms appear after an incubation of 4-5 days and, in the acute form, death supervenes 4-5 days later; the only P.M. findings are enteritis and slight haemorrhage at the entrance to the proventriculus. In the chronic form the course of the disease is much longer, followed by slow recovery; there are no P.M. findings, apart from emaciation, which is seen in both forms. Reference is made to an outbreak with heavy mortality and nervous symptoms among survivors reported by Thompson, C. H., Jr. [*V.B.* **26**, 1980]. Serological diagnosis is discussed.

—T.E.G.R.

HIPÓLITO, O. (1957). **Spectrophotometric and serum neutralization studies of sera from chickens exposed to infectious bronchitis virus.**—*Arch. Esc. Vet. Minas Gerais* **5**, 179-224. [In English.] **3597**

This is a thesis submitted to Michigan State University. Serum was obtained from chicks before infection and at intervals between 3 and 20 weeks afterwards. The albumin content of serum decreased after infection, and the amount of gamma-globulin remained constant. There was no correlation between changes in serum proteins and antibody content.—R.M.

PETEK, M. & CARLOTTO, F. (1958). Infezioni da virus e malattia respiratoria cronica. [Viruses associated with chronic respiratory disease of fowls.]—*Vet. ital.* **9**, 364-373. [Summaries in English, French and German.] **3598**

Serological tests were employed in 29 outbreaks of chronic respiratory disease. Infectious bronchitis was diagnosed in 21 and Newcastle disease in 4; in the other 4 both diseases were diagnosed. Tests for the isolation of pleuropneumonia-like organisms were limited and incomplete and results are not reported.

—T.E.G.R.

ANON. (1958). **Enteroviruses.**—*Brit. med. J.* February 8th, 330-331. **3599**

An annotation dealing with viruses found

in the intestine that may cause meningitis. There has been a flood of papers on the subject in recent years and much new information has been acquired.

What seemed at one time an orderly and useful view of these agents is breaking down. Russian workers have isolated a "new" poliomyelitis virus serologically identical with Coxsackie virus type 7. American workers have found that Coxsackie A virus, types 7 and 14 may cause poliomyelitis in monkeys. Poliomyelitis viruses may cause lesions resembling those produced by Coxsackie B viruses in animals.

It is believed that most cases of benign aseptic meningitis in man are due to virus infection. The role of poliomyelitis virus in these infections has been challenged. Tyrrell *et al.* (1957) found that infection with poliomyelitis virus was demonstrable in 15 out of 16 cases of paralytic poliomyelitis but not in 14 out of 24 cases of aseptic meningitis. No convincing evidence was found that there was infection with Coxsackie or ECHO viruses in the remaining 14 cases. Lahelle (1957) made 12 isolations of poliomyelitis virus from 98 cases of aseptic meningitis, but made 48 isolations of ECHO viruses. ECHO virus was found in two out of 18 cases of other disease and in none of 37 cases of paralytic poliomyelitis. The relation of ECHO viruses to the illnesses was supported by rises in serum antibody in the patients.

Most of the ECHO viruses were first isolated from normal children. The isolation of such a virus from the faeces of a case of aseptic meningitis does not necessarily indicate relationship to the disease. Lahelle recovered ECHO virus from the cerebrospinal fluid from about a quarter of of his cases, an indication that it may have caused the disease. His virus belonged to type 6 and others had found this type associated with aseptic meningitis.

The issue of the *Brit. med. J.* containing this annotation has two articles on the subject. Galpine *et al.* reported illness accompanied by vomiting, rash and meningism apparently due to ECHO virus type 9 in which the incidence of cases ran parallel with that of Sonne dysentery. Ash reported a similar outbreak in which attempts to determine a virus cause were unsuccessful.

Most of the ECHO type 9 viruses cause lesions in unweaned mice. Many workers have concluded that poliomyelitis, Coxsackie and ECHO viruses should be regarded as one large group which should be called "enteroviruses." They are all primarily harmless parasites of the human alimentary tract, but may cause inflam-

mation of the pharynx and minor intestinal disturbances. Some occasionally spread to the nervous system causing aseptic meningitis, poliomyelitis, and rarely encephalitis. Some less often spread to cardiac muscle, causing epidemic myalgia of the new-born.

All this presents anything but a simple picture for the clinician. The virus worker is accustomed to the sequences of individual results that appear to complicate rather than explain awkward field observations, but these tend to be clarified by later laboratory results. This process appears to be in train in connexion with these human complexes.—W.A.P.

ANON. (1958). **Antiviral chemotherapy.**—*Brit. med. J.* May 31st, 1290-1291. **3600**

A rather pessimistic review of the present position, with special reference to the use of the benzamidoles, bicarbonyls, and the thiosemicarbazones. Isatin thiosemicarbazone has much greater antiviral activity than hitherto suspected, but it is considered that no chemotherapeutic agent will be discovered which will be active against all viruses, and that probably each virus will require a separate antiviral agent.

—W. K. DUNSCOMBE.

BANG, F. B. & NIVEN, J. S. F. (1958). **A study of infection in organised tissue cultures.**—*Brit. J. exp. Path.* **39**, 317-322. [Authors' summary modified.] **3601**

Small fragments of human embryonic trachea and nasal mucosa and adult human bronchial mucosa were grown as organized tissue cultures *in vitro* using the watch glass-rayon net method. The two characteristic functions, ciliation and mucus secretion, were maintained for at least two months. The human embryonic cultures were not susceptible to infection with strains of chick-adapted influenza virus.

In tissue cultures of adult ferret mucosa the ciliated and mucus cells were destroyed by influenza virus but the deep mucosal glands and in some cases the cubical basal cells were preserved. Similar tissue from ferrets immune to influenza virus was equally susceptible *in vitro*.

Pieces of chick trachea maintained their functional integrity *in vitro*, secreting mucus which was carried by ciliary movement to one end of the trough-shaped fragments. These cultures were infected with two strains of Newcastle disease virus of differing virulence but only minimal lesions were apparent.

Human embryonic skin cultures were infected with vaccinia and herpes viruses and characteristic lesions were produced.



Human and embryonic liver fragments were grown for several weeks in organized tissue culture. Tissue survival was mainly at the rim of the explant, central necrosis being common. Infection of the human liver cultures with sporozoites of *Plasmodium vivax* yielded equivocal results.

HOYER, B. H., BOLTON, E. T., ORMSBEE, R. A., LeBOUVIER, G., RITTER, D. B. & LARSON, C. L. (1958). **Mammalian viruses and rickettsiae.**—*Science* **127**, 859-863. [Authors' summary modified.] **3602**

Techniques of column chromatography with cellulose ion exchangers were successfully applied to mammalian viruses and rickettsia. Recovery of virus was excellent, and most of the contaminating phosphorus and protein was removed. Elution characteristics of poliomyelitis virus (Types 1, 2, and 3) and Coxsackie A9 virus

were similar, whereas those of ECHO-13 and Colorado tick fever viruses differed from them as well as from each other. Elution diagrams of preparations of ECHO-13 and poliomyelitis 2 viruses grown on P<sup>32</sup>-labelled tissue cultures showed a high degree of correlation between the distribution of titratable virus and the distribution of radioactivity. A single adsorption and elution of Q fever or epidemic typhus fever rickettsia gave a striking degree of purification, as demonstrated by electron micrographs. The chromatographic behaviour of the viruses and rickettsia appeared to depend more upon the chemical nature of their surfaces than upon their size. The chromatographic procedure described may prove useful in the preparation of purified, P<sup>32</sup>-labelled, fully infectious animal viruses for further fundamental research. It may also prove useful for the removal of unwanted host materials in the preparation of vaccines.

See also absts. 3805 (report, Gambia); 3807 (report, Netherlands); 3808 (book, bacteriophage).

## IMMUNITY

MANSI, W. (1958). **Slide gel diffusion precipitin test.**—*Nature, Lond.* **181**, 1289-1290. **3603**

A report of a simpler, more rapid, and more economical method of performing the gel-diffusion precipitin test than by the usual plate method. Ordinary microscope slides are used with suitable cells. When tested with 4 viral, and 3 bacterial antigen-antibody systems the results could be read very much earlier than with the plate method, and there was economy in reagents.—W. K. DUNSCOMBE.

MATTHEWS, P. R. J. (1958). **Observations on the gel diffusion plate technique for demonstrating antigen-antibody precipitation.**—*J. med. Lab. Tech.* **15**, 95-101. [Author's summary modified.] **3604**

Use was made of an acid extract of a Group-B streptococcus and its homologous unabsorbed antiserum prepared in rabbits, to study antigen-antibody precipitation in a plate gel. The effects of variations in the constitution and physical condition of the gel, and in the shape, size, and spacing of the wells were examined. It was concluded that a satisfactory gel consists of 25 ml. of 1.5% agar in 0.85% saline, with thiomersal to a final concentration of 1 in 10,000, freshly poured into a 4-inch Petri dish and dried at 37°C. for 30 min. Round, unsealed wells 1.0 cm. in diameter, with 1.0 cm. between their circumferences, gave satisfactory precipitation lines at 20° ± 2°C.

CROWLE, A. J. (1958). **A simplified modification of the triangular double-diffusion agar**

**precipitin test.**—*Int. Arch. Allergy* **12**, 215-222. **3605**

Rectangular cells measuring 19.2 mm. deep, 12.8 mm. wide and 1.6 mm. long were constructed from transparent plastic. The cell was tilted to one side while molten agar containing the first antigen was poured into one corner. When the agar had set, the cell was tilted to the other side and the second antigen in agar was poured into the opposite corner. The triangular centre space was filled in with 1% agar to serve as a reacting area, and the "reference reactant" (serum or serum agar) was poured in to form an upper horizontal layer. The advantages of this method were simplicity of construction and technique, flexibility to meet varying combinations of antigen and antibody, and economy of reactants.—R.M.

CHANDLER, R. L. (1958). **Properdin test and conglutinin.**—*Vet. Rec.* **70**, 367. **3606**

During the final titration of the third component of complement in the properdin test of Pillemer, carried out on normal bovine serum, conglutination of the sheep erythrocytes occurred irrespective of whether human or g.pig serum was used as the source of the reagent for properdin. Therefore all the components for conglutinin appear to be present in the system for the properdin test on bovine serum.

Other observations suggest that zymosan forms a complex with conglutinin when added to bovine serum.—W. E. PARISH.

TEMPELIS, C. H., WOLFE, H. R. & MUELLER, A. P. (1958). The effect of dosage and time of injection of a soluble antigen on the production of immunological unresponsiveness in chickens.—*Brit. J. exp. Path.* **39**, 328-333. [Abst. from Survey of paper (p. ii).] **3607**

When chicks were inoculated intraperitoneally with bovine serum albumin during the first day after hatching, large doses were necessary to bring about suppression of the antibody response in later life, and the suppression was transitory.

BRAMBELL, F. W. R., HALLIDAY, R. & MORRIS, I. G. (1958). Interference by human and bovine serum and serum protein fractions with the absorption of antibodies by suckling rats and mice.—*Proc. roy. Soc. Ser. B.* **149**, 1-11. [Authors' abst. modified.] **3608**

Unweaned rats and mice derive passive immunity from the mother, mainly by way of the milk. Antibodies pass into the circulation also from immune serum administered by mouth. Sera of certain species, including rabbit, man and ox, when mixed with the immune serum administered by mouth, reduced the entry of

antibodies. This effect was called interference. The gamma-globulin fraction of either human or bovine serum was as effective as whole serum in interfering with the transmission of antibodies, whether homologous or heterologous. The albumin fraction of serum did not interfere, neither did buffered saline. The gamma-globulin must be present in considerable quantity relative to the immune globulin to be effective.

PODLIACHOUK, L. & WROBLEWSKI, A. (1958). Recherche des substances de groupes sanguins chez les chevaux et les mulets. [Blood group substances in horses and mules].—*Ann. Inst. Pasteur* **94**, 748-752. [English summary modified.] **3609**

The presence of horse and mule soluble erythrocytic blood group antigens could not be demonstrated in sera, saliva and extracts of organs of horses and mules.

In horse and mule saliva, human A and B substances were demonstrable, in agreement with the results already obtained by other authors. There was no relationship between the presence of human A and B substances and the blood group of the animal.

See also absts. 3478 (anthrax); 3489, 3491 & 3492 (swine erysipelas); 3495 (pasteurellosis); 3496 (*E. coli*); 3501 & 3504-3511 (brucellosis); 3512 (tularemia); 3525 & 3527 (Schwartzman reaction); 3562-3566 (*E. & M. disease*); 3571 (paralytic rabies); 3573-3574 (fowl pox vaccination); 3579 (tick encephalitis); 3588-3589 (rinderpest); 3591-3592 (Teschen disease); 3593 (myxomatosis); 3641-3642 & 3647 (helminths); 3809 (book, genetic resistance to disease).

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

I. THOMAS, P. L. (1958). Surface applicators for the control of lice and keds on sheep. — *N. Z. J. agric. Res.* **1**, 189-198. **3610**

II. THOMAS, P. L. (1958). The control of lice (*Damalinea ovis*) and keds (*Melophagus ovinus*) — A comparison of the efficiency of common insecticides. — *Ibid.* **217-223**. [Author's summaries modified.] **3611**

I. An account is given of trials using dusts, a high-pressure mist, and a low-pressure spray for the control of lice (*Damalinea ovis*) and keds (*Melophagus ovinus*) on sheep, using principally dieldrin as the insecticide. Dusts of 3% dieldrin, and sprays containing 0.0625% to 0.2% dieldrin gave satisfactory results, provided that a minimum of 20 mg./kg. of active ingredient, distributed over the whole sheep, was deposited.

II. Dips containing arsenic, BHC, aldrin, and dieldrin were compared. The minimum concentrations used were, respectively, 0.1% as As<sub>2</sub>O<sub>3</sub>, 0.00125% gamma isomer, 0.00125% and 0.00125%, which killed all lice and gave at least 3 months' protection against re-infection. Against keds all except arsenic were efficient.

"Jetting" with diazinon (0.0025%) and dusting with dieldrin (3%) were also completely effective against both parasites.

BROWNE, L. B. (1958). The relation between ovarian development and mating in *Lucilia cuprina*.—*Aust. J. Sci.* **20**, 239-240. **3612**

The willingness of *L. cuprina* females to mate depends on ovarian development. This is usually brought about by the female obtaining a protein meal. In most strains only few females mate in the absence of a protein meal but in one strain used in these experiments normal ovarian development and mating occurred after a carbohydrate diet. Male flies do not require protein before mating.—N. P. H. GRAHAM.

BRAUMHOVER, A. H. (1958). Florida screw-worm control program.—*Vet. Med.* **53**, 216-219. **3613**

Previous work on the eradication of a closed fly community in Curaçao demonstrated the value of releasing large numbers of sterile male screw-worm flies (*Callitroga americana*) [see also *V.B.* **26**, 1304]. For the present experiment flies



were sterilized by irradiation of the pupae and released by aeroplane at the rate of 500 per square mile per week. Results are not yet complete but it is hoped to destroy the *Callitroga* population over 2,000 sq. miles of Florida and Georgia.—W. N. BEESLEY.

ESSLINGER, J. H. (1958). **Effects of the screw-worm on guinea pigs.**—*J. Parasit.* **44**, 201-209. [Author's summary modified.] **3614**

G. pigs with heavy sublethal infestations of screw-worms (*Callitroga americana*) manifest loss in weight, rise in temperature, leucopenia and anaemia, all reaching maximum 3-4 or 6-7 days after infestation, the period during which the third instar larvae undergo their max. phase of growth. By the time the maggots have left the host (7th-8th day) symptoms begin to subside, with the exception of the anaemia, which lasts about 2 days longer. In general, animals with lighter infestations exhibit milder symptoms, and in lethal cases the clinical effects were the most severe, but there was a remarkable variation in response in different animals, some showing little effect with infestations that were extremely deleterious or lethal to others, and some dying from infestations that others tolerated very well.

HARRISON, I. R. & JOHNSON, C. A. (1958). **Persistence of aldrin and dieldrin residues in sheep fleece.**—*Nature, Lond.* **181**, 1267-1268. **3615**

Sheep dipped in 0.05% dieldrin or aldrin in May are usually protected against blowfly strike for 16 and 12-14 weeks respectively, but if aldrin dipping takes place in August protection may last for 8-9 months. Lambs dipped in 0.0125% aldrin were protected for 9-19 weeks against artificial strikes in which larvae were implanted subcutaneously. The initial concentration of insecticide in the wool fell rapidly in the first few weeks, from 0.2% to 0.06% wt./wt., and then more gradually to 0.02% after 16 weeks. Wool dipped in 0.05% aldrin cannot be cleansed of insecticide after several days' continuous Soxhlet extraction. The method by which aldrin becomes attached to the wool is still unknown but it is possible that the persistence of the related dieldrin depends on the presence of the epoxy group.—W. N. BEESLEY.

KNIPLING, E. F. (1958). **Insecticide recommendations of the Entomology Research Division for the control of insects attacking crops and livestock, 1958 season.** pp. 110. Washington. U.S. Govt. Print. Off. 55 cents. [Agriculture Handbook No. 120.] **3616**

This handbook lists insecticides recom-

mended for each type of insect: those parasitic on animals are listed between pages 99 and 107. Directions and precautions for use are given. Thus for treatment of *Hypoderma bovis* larvae rotenone is recommended for beef and dairy cattle, and Dow ET-57 for beef cattle only. There are other substances recommended for beef cattle but not for dairy cattle (e.g., malathion and toxaphene). Parasiticides for sheep, goats, pigs and poultry are also described, and there is a separate table for the control of house flies and stable flies.—R.M.

ROBERTSON, A. G. & BERNACCA, J. P. (1958). **Game elimination as a tsetse control measure in Uganda.**—*E. Afr. agric. J.* **23**, 254-261. [Authors' conclusion modified.] **3617**

The cattle population of Uganda increased between the years 1945 and 1956 from 2,294,000 to 3,094,000. This increase can be ascribed to the successful control of tsetse fly by game elimination measures.

FAIRCLOUGH, R. & THOMSON, W. E. F. (1958). **The effect of insecticidal spraying against *Glossina palpalis fuscipes*, Newstead in the Nyando River basin of Kenya.**—*E. Afr. agric. J.* **23**, 186-189. **3618**

Hand clearing of riverine vegetation as a means of controlling the tsetse fly has proved uneconomical and it was therefore decided to spray 5% DDT in the forest and reeds along the rivers. In 1951 four sprayings were carried out at fortnightly intervals [*V.B.* **24**, 2804.], but no further large-scale work followed until 1955, when it was found that *Glossina*, although greatly reduced in numbers, still occurred in some old sites and also in some new areas. Renewed insecticidal operations in 1956 finally eradicated the fly.—W. N. BEESLEY.

HYNEK, B. (1958). **Nový způsob hromadného léčení svrabu prasat a telat. [Treatment of sarcoptic mange in pigs and calves.]**—*Sborn. Čes. Akad. zemědělsk. Věd, Vet. Med.* **3(31)**, 57-68. [In Czech. Summaries in English, German and Russian.] **3619**

Sarcoptic mange in pigs and calves was controlled by spraying with "sulikol," a preparation containing colloidal sulphur and soft soap, diluted with water. Spraying was repeated four times at weekly intervals followed by six applications at monthly intervals. Barns and sties were whitewashed with lime containing 2-3% of caustic soda.—E.G.

LINDQUIST, D. A., BURNS, E. C., PANT, C. P. & DAHM, P. A. (1958). **Fate of P<sup>32</sup>-labeled**

**Bayer 21/199 in the white rat.**—*J. econ. Ent.* **51**, 204-206. [Authors' abst. modified.] **3620**

The fate of Bayer 21/199, O-(3-chloro-4-methylumbelliferone) O,O-diethyl phosphorothioate, was studied by administering the P<sup>32</sup>-labelled compound orally to rats at an average dosage of 20 mg. per kg. body wt. About 78% of the radioactivity was excreted *via* the urine

within 24 hours. Paper chromatographic analyses indicated that none of the radioactivity in the urine was Bayer 21/199 but was associated with more polar compounds. Lesser amounts of radioactivity were found in the faeces, bile, lymph, and blood. Among samples of various tissues taken 24 hours after dosage, small but significant amounts of radioactivity were found in bone, liver, and kidney.

*See also absts.* **3549** (tick eradication for control of theileriasis); **3554** (ticks transmitting Corridor disease); **3558** (experimental infection of oribatid mites with *Nosema helminthorum*); **3578** (tick encephalitis); **3581** (mosquito vectors of Japanese B encephalitis); **3583** (survival of equine encephalomyelitis virus in *Ixodes ricinus*); **3806** (report, South Holland).

## PARASITES IN RELATION TO DISEASE [HELMINTHS]

**LE ROUX, P. (1957).** **United Nations. Report to the Government of the Federation of Rhodesia and Nyasaland on the control of parasitic diseases in livestock**, pp. 47. Rome: Food and Agriculture Organization of the United Nations. [FAO Report No. 696.] **3621**

The author divided his report into sections dealing with helminths recovered from domesticated animals in the Federation, diseases due to trematode infections, intermediate hosts of human and animal parasitic trematodes, control and treatment of worm infections in farm stock, administration of anthelmintics, collection and preservation of helminths, and the prevalence of parasites other than helminths.

He concluded that insufficient attention was paid to diseases caused by helminth parasites in the Federation, and there were too few veterinary helminthologists. Diseases of the indigenous fauna and fish should be investigated as well as farm stock: there were indications that helminth parasites may lead to the extermination of some species of antelope.

Following the control of bush fires, the bush was encroaching on grazing land. It provided a microclimate suitable for certain species of worms normally confined to temperate zones. Pasture improvement schemes required to be examined from the helminthological aspect: serious worm infestation was found in cattle and sheep grazing on star grass and Rhodes grass, and on irrigated pastures.

Molluscicides for the control of fresh-water snails should be studied, and there should be close collaboration between veterinary and health departments on this subject. Greater efforts should be made to instruct farmers about helminth parasites, administration of anthelmintics and adequate nutrition.—R.M.

**NARDI, E. (1958).** Il tetracoloruro di carbonio impiegato per via sottocutanea negli ovini affetti da elmintiasi. [**Treatment of helminth**

**infestation in sheep by subcutaneous injection of carbon tetrachloride.**]—*Vet. ital.* **9**, 423-429. **3622**

In one experiment 7.5 ml. of a mixture of CCl<sub>4</sub> (3 g.) in olive oil was administered s/c to five sheep. During the following seven days there was some reduction in the egg count. On the eighth day 10 ml. of the mixture (4 g. CCl<sub>4</sub>) was administered; there was no further reduction in the egg count during the next seven days. One month after the second dose infestation was appreciably lower in four of the animals. In a second experiment 10 ml. of the mixture, administered to five sheep, caused a progressive reduction up to 45 days. This treatment was ineffective against *Dicrocoelium lanceolatum*. During these experiments there was no appreciable reduction in the egg counts of two untreated controls. No toxicity or other adverse effects were observed.—T.E.G.R.

**MERDIVENCI, A. (1958).** Evcil hindi (Meleagris gallopava) Lerimizde ilk defa olarak bulduğumuz *Echinoparyphium recurvatum* (v. Linstow, 1873) (Trematoda: Echinostomatidae). [*Echinoparyphium recurvatum* in turkeys.].—*Türk vet. Hekim. dern. Derg.* **28**, 15-22. [In Turkish. Summary in English.] **3623**

A morphological description of *E. recurvatum*, a duodenal fluke of turkeys.—E.G.

**NEWSOME, J. (1958).** Species-specific serological tests for bilharzia. — *Ann. trop. Med. Parasit.* **52**, 82-86. [Author's summary modified.] **3624**

The species-specificity of the circumoval precipitate test was investigated in *Schistosoma haematobium*, *S. mansoni* and *S. japonicum* infections in hamsters, multimammate rats, baboons and man. Anomalous reactions and false positives are described.

Live *S. mansoni* and *S. japonicum* eggs for



use in the test were stored at refrigerator temp. in Tyrode's solution and remained alive for 3-6 weeks. *S. haematobium* eggs from human urine survived only 7 days.

Saline, acid, alcoholic and Coca's solution extracts of fresh and dried *S. mansoni* eggs gave no precipitin reaction with homologous antisera. Some extracts reacted with gamma-globulin preparations from immune sera, but weak false positives were common and the extracts deteriorated rapidly on storage.

A species-specific serological test more convenient than the above is not yet in sight, but some preliminary results with egg antigen in complement-fixation tests seem to be promising.

LEROUX, P. L. (1958). The validity of *Schistosoma capense* (Harley, 1864) amended as a species.—*Trans. R. Soc. trop. Med. Hyg.* **52**, 12-14. **3625**

The author recommended the use of the name *S. capense* for the causal agent of urinary bilharziasis in S. Africa. He also discussed the classification of all other schistosomes and recommended that only the following species should be retained in the genus *Schistosoma*: *S. haematobium*, *capense*, *indicum*, *bovis*, *mattheei*, *intercalatum*, *curassoni*, *leiperi*. A new genus *Afrobilharzia* was proposed for mammalian blood-flukes of African origin (*A. mansoni*, *A. rodhaini*), *Schistosoma japonicum* was transferred to a new genus named *Sinobilharzia*; *Bilharzia margrebowiei* was transferred to a new genus named *Rhodobilharzia*; *Schistosoma bomfordi* was removed from *Ornithobilharzia* to a new genus named *Eurobilharzia*. *Ornithobilharzia naira* from the Indian elephant should be renamed *Bivitellobilharzia nairi* in view of its similarity to *B. toxodontae*. The generic status of *S. spindale*, *nasalis*, *incognitum* and *suis* was under consideration.—R.M.

DESCHENS, R. & MOLINARI, V. (1957). Sur l'action molluscicide de la grenaille de zinc. [Molluscicidal action of granulated zinc.] — *Bull. Soc. Pat. exot.* **50**, 62-65. **3626**

When 25 g. granulated zinc was allowed to stand in a litre of water, the conc. of Zn in the water attained 2.3 p.p.m. This concentration was lethal for *P. glabratus* and *B. truncatus* within 24 hours, but was not toxic for fish.

—R.M.

ENIGK, K., STICINSKY, E. & ERGÜN, H. (1958). Die Zwischenwirte von *Davainea proglottina* (Cestoidea). [Intermediate hosts of *Davainea proglottina*.] — *Z. Parasitenk.* **18**, 230-236. **3627**

Attempts were made to infect several thou-

sand snails belonging to 77 genera with proglottids of the cestode. These attempts succeeded only with members of the family Limacidae: — *Deroceas* spp. and *Lehmannia marginata*. Although it was also possible to infect *Arion subfuscus*, *Helicella* spp. and *Succinea putris*, these snails were not regarded as intermediate hosts of the cestode under field conditions.—R.M.

REINHARD, E. G. (1958). Landmarks of parasitology. II. Demonstration of the life cycle and pathogenicity of the spiral threadworm. — *Exp. Parasit.* **7**, 108-123. **3628**

This very readable article is an account of the discovery of the life cycle and pathogenicity of *Trichinella spiralis*. Beginning with the detection of immature forms in cysts in human muscle by Paget in 1835, it recounts the discoveries and experiments of Leidy, Herbst, Küchenmeister, Leuckart, Virchow, Zenker, and others, until in 1860 the scientific world knew of this dangerous parasite.—M.G.G.

GIBSON, T. E. (1958). The transmission of trichinosis by butchers' knives.—*Ann. trop. Med. Parasit.* **52**, 48-50. [Author's summary modified.] **3629**

Multiple incisions were made into the musculature of freshly killed and of 40-hour-old carcasses of guinea-pigs heavily infested with the larvae of *Trichinella spiralis*. Small numbers of larvae were recovered from the knives used on five out of eight occasions. The implication of this finding in the transmission of trichinosis to man is discussed briefly.

MARKELL, E. K. (1958). The effect of cortisone treatment upon the longevity and productivity of *Trichinella spiralis* in the rat.—*J. infect. Dis.* **102**, 158-161. [Author's summary modified.] **3630**

Sixty rats were each infected with 5,000 *T. spiralis* larvae; 40 were then treated with cortisone, and 20 were left untreated. They were killed at intervals up to 14 weeks after infection. Treatment lasted until the animals were killed. Adult worms were rare or absent in controls, but were abundant in treated animals for the first 8 weeks of treatment, and persisted, though in reduced numbers, for as long as 14 weeks. Treated animals had nearly ten times as many larvae in their muscles as controls.

DISSANAIKE, G. A., JEFFERY, G. M. & BARTON, B. P. (1958). Radioactive tagging of hookworm larvae (*Necator americanus*) with  $P^{32}$ . — *Exp. Parasit.* **7**, 249-253. [Authors' summary modified.] **3631**

Larvae of *N. americanus* were tagged with

P<sup>32</sup> by cultivation of the free-living stages in the presence of the isotope. The degree of absorption of P<sup>32</sup> was influenced by the concentration of P<sup>32</sup> in the cultures, by the addition of bacteria previously activated, and by the nature of the medium for larval or bacterial cultivation.

TROMBA, F. G. & DOUVRES, F. W. (1958).

**Cross transmission of nematodes of domestic animals. III. Preliminary observations on the infection of goats and rabbits with *Hyostrongylus rubidus*.**—*J. Parasit.* **44**, 209. 3632

The authors have previously reported experimental infection of a calf with *Hyostrongylus rubidus* [V.B. **28**, 2539]. They now report the successful infection of a kid and a rabbit with *H. rubidus*.—R.M.

ROBERTS, F. H. S. (1957). **Reactions of calves to infestation with the stomach worm, *Haemonchus placei* (Place, 1893) Ransom, 1911.**—*Aust. J. agric. Res.* **8**, 740-767. 3633

Studies were made of the fluctuations of faecal egg counts of *H. placei* from 400 calves grazing under natural conditions. Most of these animals formed a strong resistance to *H. placei*, but about 8% either failed to develop resistance, or lost it, and died.

To examine the development of infestation, experiments were made with calves reared worm-free and given known numbers of infective larvae at specified intervals. Haemonchosis did not develop in these animals. A strong resistance was rapidly acquired, even from a single dose of larvae (a test dose of larvae caused no increase in egg count, and few adult *H. placei* and many 4th stage larvae were found P.M.).

The trends of egg counts following spaced or continuous doses of larvae were similar to those resulting from a single dose, except that the highest rate of egg production persisted longer when continuous small daily doses of larvae were given. The similarity in egg count trends, regardless of the way in which larvae were given, strongly suggests that only larvae in the first few doses reached maturity in animals exposed to more than one dose.

"Self cure" was not reproduced experimentally with *H. placei* although it may occur in natural populations. The egg counts of experimentally infested animals were much higher when calves were on a 12:1 mixture of oat chaff and lucerne chaff than of calves on lucerne alone, but the infestations did not vary in their persistence.

Egg counts were an accurate index of the degree of infestation only when the animal was susceptible. When resistance occurs the egg count is of little value.

The fourth stage larvae, which had evidently persisted for many weeks, may be extremely important in the epidemiology of haemonchosis.—R. I. SOMMERVILLE.

FORSYTH, B. A. (1957). **The occurrence of *Oesophagostomum venulosum* in cattle in Australia.**—*Aust. vet. J.* **33**, 247-248. 3634

*Oes. venulosum* is recorded for the first time as a parasite of cattle in Victoria, and is probably common in cattle in winter rainfall regions.

—R. I. SOMMERVILLE.

ANON. (1958). **Milk-fed calves have fewer worms.**—*Agric. Res., Wash.* **7**, No. 2 p. 11. 3635

This is a brief report of work done by G. H. Rohrbacher, D. A. Porter and H. Herlich at the Regional Animal Disease Research Lab., Auburn, Alabama. Of 10 calves aged between 7 and 17 weeks and reared free from parasites, half continued to have milk alone and the others were given hay, grain and milk. They were infected with *Haemonchus placei* and killed 4-5 weeks later. Fewer and smaller worms were found in calves given milk only. In calves grazing infected pasture for 54 days, those given milk twice daily had fewer *H. placei*, *Cooperia* spp. and *Oesophagostomum radiatum* than calves receiving grain and no milk. A probable explanation of the difference is that the pH of the abomasum is more alkaline when milk is fed.

—R.M.

GRABER, M. (1958). **L'association dithiocarbamate de pipérazine-arséniate de plomb dans la lutte contre divers helminthes (cestodes et nématodes) du mouton. [Anthelmintic action in sheep of a mixture of piperazine dithiocarbamate with lead arsenate.]**—*Rev. Elev.* **11**, 31-39. [Summaries in English and Spanish.] 3636

Treatment for mixed nematode-cestode infection was administered to 10 pregnant ewes, 6 lambs weighing under 20 kg. and 19 adult sheep weighing 25-40 kg.; 31 were left untreated as controls. The anthelmintic mixture consisted of lead arsenate, 1 g./kg., and piperazine dithiocarbamate, 125 mg./kg. Results were satisfactory in 92% of the animals treated. For heavier animals with *Stilesia globipunctata* and *Oesophagostomum columbianum* a higher dosage is recommended: lead arsenate, 1.2 g./kg., piperazine dithiocarbamate, 140-145 mg./kg.

—T.E.G.R.

HERLICH, H. & PORTER, D. A. (1958). **An anthelmintic for cattle and sheep. Critical tests of efficacy of Bayer 21/199.**—*Vet. Med.*



53, 343-348 & 360. [Authors' summary modified.] **3637**

Bayer 21/199, O,O-diethyl O-(3-chloro-4-methyl-7-coumarinyl) phosphorothioate, was tested for anthelmintic activity in cattle and sheep. Tests indicated that, when administered at 25 mg./kg. live wt., it was highly efficient against species of the genera *Haemonchus*, *Ostertagia*, *Trichostrongylus*, *Cooperia*, *Trichuris*, *Capillaria* and *Strongyloides papillosus*. Against *Nematodirus* spp. and *Bunostomum phlebotomum* it was erratic and generally unsatisfactory. Symptoms indicating some intoxication were noted but were mild and transitory, and the drug might prove therapeutically useful in dosage not exceeding 25 mg. or less/kg. live wt. The chemical is not recommended until its safety can be confirmed by further trials.

HALEY, A. J. (1958). Host specificity of the rat nematode, *Nippostrongylus muris*. — *Amer. J. Hyg.* **67**, 331-349. [Author's summary modified.] **3638**

Rats harboured, on the average, about 13 times as many adult *N. muris* as hamsters did after the inoculation of the two hosts with similar doses of a rat strain of the parasite. A much greater proportion of larvae failed to complete the somatic migration in hamsters than in rats. Passage of *N. muris* in hamsters substantially increased its infectivity for this host. It was concluded that the character of the parasite, and the proportion of different types present in a given population, were vital factors in determining the specificity of the host-parasite relationships studied.

TINER, J. D. (1958). A preliminary *in vitro* test for anthelmintic activity.—*Exp. Parasit.* **7**, 292-305. [Author's summary modified.] **3639**

0.01 ml. of a volatile solvent containing an anthelmintic was applied to dried *Escherichia coli* cells, which supply nematode growth factors. After the solvent had evaporated, a suspension of nematode inoculum was introduced. The numbers and stages of nematodes that developed during the next few days were recorded. Results were judged against those for the standard of reference, phenothiazine. Larval trichostrongyles were more susceptible than truly saprophytic nematodes (*Caenorhabditis briggsae*) to phenothiazine, 1-piperoylpiperidine, the ethylthioester of 5-nitro-2-furoic acid, and quinine alkaloids. The susceptibility of the various stages of the nematodes differed.

New procedures included the use of a salt concentration gradient tube for collecting eggs; volatile solvents for applying chemicals to dried

food material for test organisms; a pipette for cleaning culture dishes; and monoxenic parasites for screening.

GOODWIN, L. G. (1958). A method for recording the effects of anthelmintics on the movements of *Ascaris lumbricoides*. — *Brit. J. Pharmacol.* **13**, 197-201. [Author's summary modified.] **3640**

Adult *A. lumbricoides* obtained from pigs were suspended individually in modified Tyrode solution at 37° in fine nylon "stockings," 4-8 to 6.4 mm. in diameter, and the movements of the stockings were recorded.

Piperazine salts caused gradual narcosis, the onset of which was related linearly to the logarithm of the concentration of drug in the bath. The method is suitable for the assay of preparations of piperazine. Tetrachlorethylene, hexylresorcinol, and oil of chenopodium all caused stimulation of movement before the worm was immobilized. Santonin caused incoordination of the movements of the anterior end of the worm; the movements of the body were apparently unaffected. Piperazine is the safest preparation available for the treatment of ascariasis.

KAGAN, I. G. (1958). Hemagglutination tests with *Ascaris* antigens.—*J. Immunol.* **80**, 396-399. [Author's summary modified.] **3641**

Antisera against *Ascaris lumbricoides* var. *suum*, *A. lumbricoides*, *Toxocara canis*, and *T. cati* were prepared in rabbits by injection of freeze-dried antigen and infection with viable eggs. These antisera cross-reacted with *Ascaris* and *Toxocara* antigens in haemagglutination tests. Absorption with heterologous antigen removed cross-reacting antibodies and produced generic specific antisera. Serum obtained by injection of antigen, showed higher titres than sera obtained by infection with viable eggs. Antisera prepared against polysaccharide whole-worm antigen obtained from human and pig ascarid worms, cross-reacted with antigen prepared from these 2 worms. Absorption of these sera with both homologous and heterologous antigens reduced the titres to 0. From the data, it was concluded that crude polysaccharide antigen does not exhibit species specificity. Antigens prepared from saline extracts of whole worm or tissues of pig ascarids are effective antigens in the haemagglutination test, and without preliminary absorption, antigens of *Toxocara* or *Ascaris* worms cross-react with antisera prepared against these species.

KAGAN, I. G., JESKA, E. L. & GENTZKOW, C. J. (1958). Serum-agar double diffusion studies

with *Ascaris* antigens. II. Assay of whole worm and tissue antigen complexes. — *J. Immunol.* **80**, 400-406. [Abst. from authors' summary.] **3642**

An antigenic analysis with an agar double diffusion technique was made with *Ascaris lumbricoides* var. *suum* antigens. Whole worm antigens (saline soluble extracts) were compared to autoclaved antigens and polysaccharide-protein antigens prepared by a variety of methods. Four techniques were assayed for the preparation of polysaccharide antigens.

Initial boiling of whole worm homogenate with 30% KOH followed by precipitation with ethanol yielded an antigen that showed 1 band in the agar assay. Polysaccharide-protein antigens obtained with ethanol, formamide and acetone precipitation showed 4-9 bands with whole worm homogenate. Tissue polysaccharide-protein antigens were less complex than the whole worm antigen when they were prepared with formamide. The formamide method in general yielded antigens that were immunologically less complex than antigens produced by the other methods (with the exception of the KOH method with the whole worm antigen).

SPRENT, J. F. A. (1958). Observations on the development of *Toxocara canis* (Werner, 1782) in the dog.—*Parasitology* **48**, 184-209. [Author's summary modified.] **3643**

Pups are commonly infected with larvae of *T. canis* at birth and prenatal infection can be produced by feeding embryonated eggs to pregnant bitches.

Observations on 58 dogs in Brisbane showed that all of 29 puppies 1-6 months old were infected, while only three of 29 dogs over 6 months old were infected.

In naturally infected puppies, third-stage larvae were present in the lungs at birth. Third-stage larvae continued to appear in the lungs for the first week of life; their length was 0.6-1.3 mm.

Third-stage larvae were found in the stomach on the day after birth, and the third moult took place at a length of 1.0-1.3 mm. in the lungs and stomach within the first week of life.

By the beginning of the second week, fourth-stage larvae were fully grown and had commenced the fourth moult at a length of 5-7 mm.

Throughout the second and third weeks, adults grew rapidly, reaching a length of about 67 mm. by the end of the third week, but no eggs had appeared in the faeces at this time.

Experimental infection of mice with eggs showed that the larvae were distributed to the

somatic tissues, few reaching the alimentary tract. The larvae did not progress beyond the second stage in the tissues of mice.

In experimentally infected dogs over 5 weeks old the larvae were distributed to the somatic tissues and did not reach the alimentary tract. The larvae did not progress beyond the second stage. In contrast, 1 to 3-week-old puppies infected in the same way were found to harbour larvae in the alimentary tract.

Experimental infection of dogs and foxes with mice harbouring second-stage larvae in the tissues showed that, in some instances, development of larvae proceeded in the alimentary tract. No evidence of somatic migration was found in dogs infected in this way, but in foxes second-stage larvae were found in the lungs.

The structure and development of the second, third and fourth stage is described in detail and found to resemble closely the development of *T. cati* larvae.

The migratory behaviour of the larvae of *T. canis* and *T. cati* is compared and discussed in relation to their wide range of hosts.

REID, W. M. & CARMON, J. L. (1958). Effects of numbers of *Ascaridia galli* in depressing weight gains in chicks.—*J. Parasit.* **44**, 183-186. **3644**

338 chicks were each given 300 infective eggs of *A. galli*. Weight gain of the birds decreased as the number of worms increased. It was calculated that each worm was responsible for a weight loss of 1.39 g.—R.M.

THIENPONT, D. & BICHE, Y. (1957). La microfilariose cutanée aiguë des bovidés. [Acute cutaneous onchocercosis in cattle.] — *Ann. Soc. belg. Méd. trop.* **37**, 693-695. [In French. Summaries in English, Flemish, German and Spanish.] **3645**

Acute dermatitis of the face just below the horns was observed in 2 adult cattle in the Belgian Congo. Examination revealed numerous *Onchocerca gutturosa* microfilariae in the lesions. One case recovered spontaneously after a fortnight. The other was treated with "carbilazine" (diethylcarbazine citrate) administered orally and recovered after 3 days.—R.M.

NICHOLAS, W. L. & HYNES, H. B. N. (1958). Studies on *Polymorphus minutus* (Goeze, 1782) (*Acanthocephala*) as a parasite of the domestic duck.—*Ann. trop. Med. Parasit.* **52**, 36-47. [Authors' summary modified.] **3646**

The development of *P. minutus* in the duck is described with details of its life-span. It is shown that starvation of the bird can lead to



elimination of the parasite. The worms appear to establish themselves less readily in the intestines of birds which are already infected; this may account for the rarity of deaths due to the parasite. Only uninfected birds suddenly exposed to heavy infection are likely to acquire a large number of parasites. Infected shrimps are widespread, and often common, throughout the British Isles.

SCOTT, J. A. & MACDONALD, E. M. (1958). Immunity to challenging infections of *Litomosoides carinii* produced by transfer of developing worms. — *J. Parasit.* **44**, 187-191. [Authors' summary modified.] 3647

When larvae of *L. carinii* which have developed 7 days in a cotton rat are introduced surgically into the abdominal cavity of previously unexposed cotton rats on 3 successive occasions, the worms of a subsequent superimposed infec-

tion are somewhat retarded in growth and development as compared with worms of parallel primary infections. This retardation is apparently not as great as that produced by infective larvae similarly introduced. A greater number of the older larvae appears to be necessary for a threshold effect. Whether these results can be explained by differences in type or amount of antigen or by differences in the propensity to migrate through tissues is an open question.

DAVIDSON, M. (1958). [Leech infestation in the Government beef herd at Karei Deshe.] — *Refuah vet.* **15**, 16-17. [In Hebrew. Abst. from English summary p. 43.] 3648

Cattle dying suddenly were found to have anaemia, heavy infestation of the oral cavity with leeches, and no other pathological changes except for petechiae on the serosa of the gall-bladder in one case. The water supply was infested with leeches.—R.M.

See also absts. 3558 (experimental infection of tapeworms with *Nosema helminthorum*); 3806 (report, South Holland).

# SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

PUSTOVAR, Y. P., SHALDUGA, N. E. & KORZH, P. M. (1958). [Cancer of the orbit of cows.] — *Veterinariya, Moscow* **35**, No. 4, pp. 57-62. [In Russian.] 3649

Cancer of the eye was first diagnosed in cows purchased at a market. The farm from which these cows came was traced, and further cases occurred later on this and a neighbouring farm. In the 24 cases observed, only one eye was affected; neither bulls nor bullocks were affected. The neoplasms were composed of atypical squamous cells with nests of keratinized cells and pearl-like formations of keratin. Metastases, in the parotid lymph nodes, were observed in 3 cases. Surgical removal of the neoplasms was attempted in all 24 cases and was successful in 12, in which the process was localized to the third eyelid (3 cases), anterior part of the eyeball (4 cases) or the lower and third eyelids and eyeball (5 cases).—R.M.

SEELE, W. (1958). Beitrag zum Vorkommen von Tumoren beim Schwein und Rind. [Neoplasms of ovary in a sow and kidney in a cow.] — *Dtsch. tierärztl. Wschr.* **65**, 329-331. [Summary in English.] 3650

During meat inspection S. found a sarcomatous mixed tumour of an ovary in a sow aged 18 months, and a papillary cystadenoma of a kidney in a cow aged about 6 years. Both animals were apparently healthy before slaughter.—R.M.

KAST, A. (1958). Herzbasis tumoren beim Hund. [Heart-base tumours in the dog.] — *Zbl. VetMed.* **5**, 459-474. [Summaries in English, French and Spanish. English summary modified.] 3651

Of 80 heart-base tumours recorded in the literature, 20 were considered to have originated from thyroid tissue, 5 from aberrant parathyroid tissue and 55 from aortic chemoreceptors. When account is taken of their localization, macroscopic and histological structure and their action on the host it seems likely that in all these cases as well as in six new cases studied by the present author, the tumour had originated from the thyroid. The existence of tumours arising from parathyroid or chemoreceptor tissues has not been sufficiently established.

BLOOM, G., LARSSON, B. & ÅBERG, B. (1958). Canine mastocytoma. — *Zbl. VetMed.* **5**, 443-458. [In English. Summaries in French, German and Spanish. Authors' summary modified.] 3652

Among 27,278 licensed dogs in Stockholm, 60 cases of mastocytoma were found and, of these, 49 were in Boxers. Sex distribution proved to be equal. The mean age for Boxers with mastocytoma is 6.62 years.

A brief outline is given of the clinical aspects. Localization of the tumours is variable but generally on the rear parts of the body. Their appearance varies according to location, dif-

ference in growth rate, local connective tissue contents, ulceration and other factors. The treatment of choice is surgical removal. The most common post-operative complication is bleeding. This can be checked by parenteral administration of antihistamine. Treatment with cortisone, which has been reported to give excellent results, was tried in some of the present cases but recurrences occurred.

Special attention was given to the histopathology of the tumours. Light as well as electron microscopical observations are presented. The effect of histamine liberators on the tumour cells was studied. An account is given of some chemical and physiological experiments on the relationship between mastocytoma, heparin and histamine. From the results it appears that heparin and histamine may form a complex in which histamine preserves its physiological effects while heparin loses its effect on the coagulation of blood.

I. JACOB. (1958). Hirntumoren bei Hunden. [**Brain tumours in dogs.**]—*Zbl. allg. Path. path. Anat.* **97**, 505. **3653**

II. LIESEGANG. (1958). Hirntumoren bei Haustieren. [**Brain tumours in domestic animals.**]—*Ibid.* 505-506. **3654**

I. J. briefly described a primary mesenchymal sarcomatous blastoma in the occipital region of the left hemisphere of a male Boxer aged 9½ years, and an angiomatous blastoma of the medulla oblongata, arising from the choroid plexus of the rhombencephalon, in an Airedale bitch aged 9 years.

II. Three cases were briefly described: a plexus papilloma of the right cerebral ventricle in a Chow dog aged 8 years, without metastases;

neurinoma of the acoustic nerve in an ox; medulloblastoma of the pons in a Boxer dog aged 8 years.—R.M.

SCHULZ, L.-C. (1958). Vergleichende Betrachtungen zum Sarkombefall bei Mensch und Hund. Ein Beitrag zur Ätiologie traumatischer osteogener Sarkome. [**Comparative study of sarcoma in man and dog. The aetiology of traumatic osteogenic sarcoma.**]—*Z. Krebsforsch.* **62**, 278-290. **3655**

At the Hannover veterinary school 62 tumours were found in 378 dogs submitted for P.M. examination during 2 years; of 21 bone tumours, 10 were osteogenic sarcoma. These data were compared with those of other authors. The causation of bone tumours by a single mechanical insult was discussed.—R.M.

DEKKER, N. D. M. & KRONEMAN, J. (1958). Leucose bij het paard. [**Lymphatic leucosis in a horse.**]—*Tijdschr. Diergeneesk.* **83**, 469-478. [In Dutch. Summaries in English, French and German.] **3656**

A detailed study of a case.—R.M.

MAGLIONE, E. & DOTTA, U. (1957). Osservazioni sulla eredità della leucosi aviare. [**Transmission of the avian leucosis complex through the egg.**]—*Atti Soc. ital. Sci. vet., Perugia* **1956** **10**, 524-527. [English and French summaries.] **3657**

Infertility and embryo mortality in eggs used at the laboratory were investigated. Avian leucosis was diagnosed on the farm supplying the eggs and in three of the only four chicks hatched from a batch of 48 eggs from infected hens. It is concluded that infection is transmitted through the egg.—T.E.G.R.

## NUTRITIONAL AND METABOLIC DISORDERS

CLARKE, E. A. & FILMER, D. B. (1958). **Studies in hogget rearing. I. General characteristics of hogget ill-thrift.**—*N. Z. J. agric. Res.* **1**, 249-264. [Authors' summary modified.] **3658**

The problem of ill-thrift of hoggets in the autumn is discussed and various known causes of unthriftiness are dealt with. The characteristics and symptoms of the syndrome are given. The most striking symptom is the cessation of growth or loss of weight on well controlled pastures of apparently high nutritive value. The condition varies in intensity with year, district, farm, and paddock, but its onset generally coincides with the growth of autumn grass. Lambs born out of season and weaned at the normal age in early October failed to show ill-thrift in the spring and summer, but ceased to grow during

the autumn flush on the same pastures. It was shown that age and weight at weaning are not factors associated with unthriftiness, nor are breed or sex.

CRESSWELL, E. (1958). **Double scapula in sheep.**—*J. agric. Sci.* **50**, 115-122. **3659**

Double scapula, a condition in which the outer plate of the frontal bone of the skull is very thin, is found in large numbers of young and apparently healthy sheep on hill farms in the north of England and southern Scotland. It is associated with a generalized thinning of the skeleton. The provision of a mineral mixture, and dosing with phenothiazine, dicalcium phosphate, trace elements and vitamin D, had no significant effect on the incidence of double scapula.



or on weight gains. Heavy parasitism was not found and blood samples did not show calcium or phosphorus deficiency. X-ray examination, however, revealed small improvements in the skeleton of sheep dosed with dicalcium phosphate and vitamin D<sub>2</sub>. It is concluded that the condition is due to a low level of nutrition and could not be prevented merely by the adjustment of a few of the dietary factors.—M.G.G.

BENNETTS, H. W. (1958). **A nutritional dilemma.** —pp. 13. Perth: Royal Australasian College of Physicians. [Annie B. Cuning Lectures on Nutrition No. 10.] 3660

Reference is made to the importance of subterranean clover to Western Australian agriculture and conditions under which infertility occurs in sheep grazing it. A brief historical outline is given of research which enabled the disease to be controlled.—T. J. GRAINGER.

MANGAN, J. L. (1958). **Bloat in cattle. VII. The measurement of foaming properties of surface-active compounds.** —*N. Z. J. agric. Res.* 1, 140-147. [Author's summary modified.] 3661

An apparatus is described for estimating the expansion, dynamic stability, and strength of foams formed by surface active compounds. Three solutions may be examined simultaneously. Foam strength is the most useful measurement and was used to show that the properties of lucerne saponin foams are dependent on pH whereas those of yucca saponin foams are not. The possible significance of these measurements in the problem of bloat is discussed briefly.

BODA, J. M. (1958). **Studies on the experimental production and prevention of bloat in cattle. II. The influence of dehydration on the bloat-producing ability of alfalfa.**—*J. Dairy Sci.* 41, 295-301. [Author's summary modified.] 3662

Commercial dehydration greatly reduced the ability of lucerne to produce bloat. A coincident study was made of the effect of fresh and dehydrated lucerne on rumen motility and eructation in one cow. In the first trial, fresh lucerne was assayed for three consecutive days, following a four-day preliminary period, using eight bloat-susceptible cattle. Lucerne, collected from the same field on the second day of the assay period, was dehydrated for the subsequent comparative trials. The fresh lucerne was fed *ad libitum* for 2-hour periods, at 8 A.M. and at 1 P.M. Lucerne consumption for each cow was determined. The degree of bloat was estimated with a tympanometer. The same procedure was

followed in assessing the dehydrated lucerne, except that each cow's intake was limited on the basis of dry matter to the amount of fresh lucerne consumed previously. The average, maximal, intra-rumen gas pressures attained were 27 mm. Hg above atmospheric pressure with fresh lucerne and less than 5 mm. Hg with dehydrated lucerne. It is suggested that a partial explanation for this reduction of bloat associated with dehydration may be a denaturation of water-soluble plant protein.

PACKETT, L. V., JR., WATKINS, T. D., JR. & KUNKEL, H. O. (1958). **Influence of dietary chlortetracycline on incidence of urinary calculi in sheep.** —*Proc. Soc. exp. Biol., N.Y.* 97, 860-863. 3663

276 wether lambs were divided into 7 lots and self-fed a total mixed diet containing in some lots a nitrogen supplement of either cottonseed meal or urea. When used, chlortetracycline was added at a level of 10 mg. per lb. of feed. 26 deaths from urinary calculi occurred, there being significantly fewer death losses in animals fed chlortetracycline. Fewer deaths occurred among lambs fed urea than cottonseed meal as a source of nitrogen. This result was reflected in an examination of calculi in the kidneys of the remaining lambs at slaughter. The possibility of a physiological effect of dietary chlortetracycline on the reduction of renal calculus formation and subsequent death from urinary calculi is suggested.—D. S. PAPWORTH.

BUSSEL, B. W., NORMAN, G. R. & WILKIE, W. J. (1958). **Feeding antibiotic feed supplements to pigs.**—*J. Dep. Agric. S. Aust.* 61, 481-482. 3664

In two trials litter pairs of pigs were used. One of each pair was allotted to control groups and the other to groups fed 'terramycin' as a supplement at the rate of 10 g. per ton of feed.

Trial I (8 pairs used) was during the spring and under favourable conditions for growth. The pigs had access to pasture, and were fed from self feeders. Those receiving the supplement added an average of 6.4 lb. more weight, and consumed 13.2% less food per 100 lb. weight gain than the controls.

Trial II (14 pairs used) was during a hot dry summer and autumn. The 'terramycin' group gained only 2.0 lb. (average) more weight than the controls, but there was a marked improvement of food utilization (17.2% less food per 100 lb. weight gain). They reached marked weight 15 days earlier than the controls.

—A. G. CULEY.

ABRAHAM, J., CHAMPIGNY, O. & JACQUOT, R. (1958). Influence de l'auréomycine sur les échanges respiratoires du rat blanc. [**Influence of chlortetracycline on respiratory exchange in rats.**—*C.R. Acad. Sci., Paris* 246, 3520-3523. 3665

Growing rats receiving a ration containing chlortetracycline at 100 mg./kg. of food had a higher respiratory quotient and lower consumption of oxygen per unit of weight gain than untreated rats. It was suggested that the growth-promoting effect of the antibiotic was related to a reduction in energy requirement. —R.M.

WAKELAM, J. A. & JAFFE, W. P. (1958). **Growth-promoting factors in malt distillers dried solubles. Field trials and preliminary findings.** — *Brit. J. Nutr.* 12, 147-158. [Authors' summary modified.] 3666

In field trials with chicks and turkeys the addition of malt distillers' dried solubles at about 5% to diets complete in all known nutrients led to increased growth. As a result of these trials, laboratory work was done and is reported in detail.

A standard diet of semi-purified ingredients and containing all known nutrients at high levels was developed which gave consistent growth responses of the order of 6-7% when distillers' solubles were added.

In the experiments reported groups of 25 male chicks were taken from day-old to 4 weeks and fed *ad libitum*. There were 16 such groups in each experiment, and the usual arrangement was to test eight modifications of the standard diet by an 8×2 random block arrangement. Statistical analysis was made of all results and the growth response to distillers' solubles was almost always significant at the 5% level.

Considerable variability of response was found to different levels of addition of distillers' solubles, but an effective maximum response was obtained at a level somewhere between 2 and 3%.

Other distillery by-products (dried distillery concentrate and acetone-butanol fermentation solids) did not appear to contain any unidentified factor present in malt distillers' solubles.

Some similarity was found between the response to solubles and to procaine penicillin, although the one supplemented the other. The effects upon these responses of removing the brooders to a new house suggested a possibly similar mode of action.

LILLIE, R. J., SIZEMORE, J. R. & DENTON, C. A. (1958). **A study of surface active agents in**

**broiler diets.** — *Poult. Sci.* 37, 288-292. [Authors' summary modified.] 3667

A quaternary ammonium compound administered in the drinking water did not improve growth or efficiency of feed utilization in chickens. Five blends of surface active agents incorporated in the diet improved growth consistently, although not significantly. All the blends caused a better growth response than procaine penicillin at 4 g. per ton of feed. Feed conversion was improved by 4 of the 5 blends and by procaine penicillin.

SHIBATA, F. & UMETSU, M. (1957). **The appearance of combined volatile fatty acids in ruminant blood.**—*Tohoku J. agric. Res.* 8, 161-164. [In English. Authors' summary modified.] 3668

Methanolic extracts of the whole blood, plasma and serum of cows were saponified and distilled from aqueous solution and then titrated with alkali.

The levels of combined volatile fatty acids in cow's blood were maintained at about 40 to 60 mg. as acetic acid per decilitre of blood for several hours after feeding. The concentration of these acids would seem to be 5-10 times that of the free volatile fatty acids in the jugular blood.

The conc. of combined volatile fatty acids in serum was about half that in the whole blood and their conc. in plasma was one and a half times that in the whole blood.

YOKOYAMA, K. & ISHIDA, K. (1958). **Histochemical studies of pigment in adipose tissue of swine attacked by the so-called yellow fat disease.**—*Tohoku J. agric. Res.* 8, 113-119. [In English. Authors' summary modified.] 3669

The deposition of yellow or yellowish brown pigment occurred in the interstices of the adipose tissues as large globules and fine droplets in groups of various sizes. Lymphoid cells were found in the highly pigmented areas. Histochemically, the pigment resembled lipofuscin. It was not found in the liver and spleen.

BAGEDDA, G. (1958). **Accorgimento tecnico per la valutazione delle glico e lipo-proteine seriche. [Heated glycerol for the evaluation of serum proteins by paper electrophoresis.]**—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957, 11, pp. 347-349. [Summaries in French and German.] 3670

Immersion of the strips in glycerol heated to 60°C. facilitated the electrophoretic evaluation of glyco- and lipoproteins. The glycerol is



more rapidly and completely absorbed by the strips, decoloration is improved and a homogeneous transparency is obtained.—T.E.G.R.

WILSON, A. A. (1958). **The aetiology of grass tetany.**—*Vet. Rec.* **70**, 406. **3671**

Recent work in Gt. Britain suggests that there is a decreased intestinal absorption of magnesium in cattle affected with grass tetany, possibly resulting from a high concentration of ammonia in the rumen. W. points out that if this occurs not only will the animal fail to absorb magnesium from the diet, but it will fail to re-absorb it from its own intestinal secretions, which are considerable in the ruminant.

Dutch workers claim that a high potassium intake is associated with grass tetany. As potassium and ammonium ions have certain similar chemical properties, they may act in the same manner in this disease.—E. J. CASTLE.

TILLMAN, A. D. & BRETHOUR, J. R. (1958).

**Dicalcium phosphate and phosphoric acid as phosphorus sources for beef cattle.**—*J. Anim. Sci.* **17**, 100-103. **3672**

Twelve yearling Hereford steers were used to compare phosphoric acid and dicalcium phosphate as sources of phosphorus in the diet. Both substances furnished 60% of the phosphorus in rations which contained equal amounts of calcium. No statistically significant differences were found in apparent and true digestibility, net retention and faecal endogenous excretion of phosphorus between the two treatments.

—E. J. CASTLE.

WISE, M. B., SMITH, S. E. & BARNES, L. L. (1958). **The phosphorus requirement of calves.**—*J. Anim. Sci.* **17**, 89-99. **3673**

Forty Holstein calves aged 12 weeks were fed a semi-purified basal ration containing 0.09-0.1% phosphate to which seven different levels of dicalcium phosphate were added supplying total phosphorus levels on an air dried basis from 0.09 to 0.38% of the diet. Various criteria including total food intake and efficiency, body weight gains, serum phosphorus and phosphatase levels and bone growth and ash percentage were used. It was concluded that the minimum phosphorus requirements of calves weighing 200-275 lb. at 12-18 weeks of age was approx. 0.22% of the air dried ration.—E. J. CASTLE.

TILLMAN, A. D. & BRETHOUR, J. R. (1958).

**Utilization of phytin phosphorus by sheep.**—*J. Anim. Sci.* **17**, 104-112. **3674**

Twelve sheep about 18 months old and weighing about 90 lb. were used to compare calcium phytate and monocalcium phosphate as sources of phosphorus. They were divided into

2 groups, each receiving a basal diet and the supplement which provided 70% of the total phosphorus intake. There were no statistically significant differences between treatments in apparent and true digestibilities of calcium and phosphorus, their net retention and faecal endogenous excretions.—E. J. CASTLE.

PLUMLEE, M. P., JORDAN, C. E., KENNINGTON, M. H. & BEESON, W. M. (1958). **Availability of the phosphorus from various phosphate materials for swine.**—*J. Anim. Sci.* **17**, 73-88. **3675**

The availability of phosphorus for growing pigs from various sources of phosphate was investigated in five experiments using a total of 23 treatments. The 6 weaners on each treatment were all fed individually on a basal low phosphorus semi-purified diet to which the various supplements were added. Details of the diet which varied slightly from experiment to experiment are given. Finally 3 groups of 12 pigs fed a commercial ration were given some of the supplements.

Observations were made on growth rate, food consumption, feed efficiency, serum phosphorus levels, bone ash and content of phosphorus and fluorine, femur breaking strength and clinical condition.

The supplements ranked in the following order: (1) dicalcium phosphate, monocalcium phosphate and phosphoric acid, (2) steamed bone meal and defluorinated phosphate, (3) Curaçao Island phosphate and (4) soft phosphate with colloidal clay.—E. J. CASTLE.

HARLEY, R. & BECK, A. B. (1958). **Cobalt deficiency of stock in the Busselton-Augusta region.**—*J. Agric. W. Aust.* **7**, 205-209. **3676**

The incidence and degree of cobalt deficiency as measured by chemical analyses of a single liver from each of 51 districts and 20 livers from 1 district, are discussed and illustrated on a map of the region.—T. J. GRAINGER.

ANDREWS, E. D., STEPHENSON, B. J., ANDERSON, J. P. & FAITHFUL, W. C. (1958). **The effect of length of pastures on cobalt-deficiency disease in lambs.**—*N. Z. J. agric. Res.* **1**, 125-139. [Authors' summary modified.] **3677**

On Otapiri silt loam cobalt-deficiency disease was more marked in lambs on a paddock where herbage was long, than on adjacent paddocks where herbage was short. Heavy grazing, however, reduced the severity of the disease in this paddock, and prevented it entirely in other paddocks less deficient in Co. It is considered that the most probable explanation of the pro-

tection afforded by heavy grazing is the ingestion of soil. It was estimated that the minimal intake of Co needed by lambs is about 0.11 p.p.m.

DEWEY, D. W., LEE, H. J. & MARSTON, H. R. (1958). **Provision of cobalt to ruminants by means of heavy pellets.**—*Nature, Lond.* **181**, 1367-1371. **3678**

The development of a method whereby sheep and cattle grazing cobalt-deficient pastures can be provided daily with minute quantities of cobalt is described. A search was made for a suitable cobalt compound which, when made into heavy pellets, would remain in the forestomachs and give off the required amount of cobalt each day. Of several substances tested, cobalt oxide mixed with small amounts of china clay was the most suitable. X-ray studies showed that heavy pellets given orally are quickly transferred to the reticulum where they generally remain but they are occasionally found in the rumen. Very rarely are they regurgitated and never passed on through the tract.—E. J. CASTLE.

RAINEY, J. W. (1958). **Rupture of the round ligament of the hip joint in cattle.**—*Aust. vet. J.* **34**, 160. **3679**

It is reported that five of the six cases of this condition reported previously [*V.B.* **25**, 3867] occurred in an area of cobalt-copper deficiency.—A. G. CULEY.

ROBERSON, R. H. & SCHAIKLE, P. J. (1958). **Zinc requirement of the chick.**—*Science* **127**, 875-876. **3680**

Chicks receiving a diet containing 7 or 19 p.p.m. of zinc grew slowly, converted food inefficiently, and developed severe dermatitis of the feet, stunted feathers, and a stiff gait. Control chicks receiving over 100 p.p.m. of zinc in the diet were normal.—M.G.G.

CREEK, R. D., PARKER, H. E., HAUGE, S. M., ANDREWS, F. N. & CARRICK, C. W. (1958). **The relationship of iodine and fluorine in the diet of the chick.**—*Poult Sci.* **37**, 295-297. [Authors' summary modified.] **3681**

Severe iodine deficiency retarded the growth of chicks. High concentrations of fluorine in the diet retarded growth more at a very low intake of iodine than at higher intakes of iodine. The addition of fluorine to diets containing 22 and 75  $\mu\text{g.}/\text{kg.}$  of iodine increased the iodine content of the thyroid gland. This effect was not observed when the diets contained 150  $\mu\text{g.}/\text{kg.}$  of iodine.

MCGILLIVRAY, W. A. & WORKER, N. A. (1958). **Effects of ingestion of paraffins by ruminants. IV. Effects of paraffins and other substances**

**on the utilisation of high dosage levels of carotene.**—*N. Z. J. agric. Res.* **1**, 267-272. [Authors' summary modified. For previous parts, see *V.B.* **28**, 1159-1161.] **3682**

Paraffins, waxes, and a sterol depressed the utilization of carotene in chickens, the effect being related to the concentration in the vehicle. The depressant effect decreased with rising melting point. The triglyceride composition of the vehicle was important, carotene being less efficiently utilized from the softest and hardest fats.

MCGILLIVRAY, W. A. & WORKER, N. A. (1958). **The effect of tocopherol on the utilisation of intravenously administered carotene.**—*N. Z. J. agric. Res.* **1**, 273-280. [Authors' summary modified.] **3683**

High concentrations of tocopherol in the blood and tissues inhibited the conversion of carotene to vitamin A in rats. It is concluded that carotene administered i/v breaks down rapidly, possibly in the blood, to an intermediate which is then converted more slowly to vitamin A.

BALDISSERA NORDIO, C. & PASTI, C. (1958). **Influenza del beta-carotene sulla produzione e sul peso delle uova di anatre khaki campbell. [Effect of  $\beta$ -carotene on egg production in ducks.]**—*Atti Soc. ital. Sci. vet., Rimini-Ravenna* 1957. **11**, pp. 331-333. [Summaries in English and French.] **3684**

The addition of carrot oil (containing  $\beta$  carotene) to the diet increased the number and weight of eggs.—T.E.G.R.

SCHAFFRATH, J. (1957). **Das Verhalten des Nukleinsäurestoffwechsels der Ratte in Abhängigkeit von hohen Vitamin A-Gehalten des Blutes. [Changes in nucleic acid metabolism during increased vitamin A content of blood in rats.]**—*Inaug. Diss., Munich* pp. 65. **3685**

After i/v infusion of 3,000 i.u. vitamin A during 3 hours, the amount of deoxyribonucleic acid in skin, intestine, kidney, lung and brain was increased, as was also ribonucleic acid in adrenal gland, kidney and heart.—R.M.

CHRISTENSEN, N. O., ENGELUND, A. & TERP, P. (1958). **Studies on the absorption of vitamin A. III. Long-term experiments in rats using the growth and xerophthalmia method.**—*Nord. VetMed.* **10**, 393-406. [In English. Summaries in German and Danish. Authors' summary modified.] **3686**

Long-term experiments were carried out on rats to investigate the utilization of vitamin A



administered in different vehicles and by different methods. The criteria used were: increase in weight, survival time, and prevention of xerophthalmia.

Intramuscular injection of vitamin A in oil or ethyl oleate was as effective as oral administration in oil, ethyl oleate or in aqueous dispersion, and intramuscular injection in aqueous dispersion.

Although small daily doses given orally was the most rational method it was justifiable, therapeutically and economically, to substitute these doses with fewer and larger intramuscular injections in oil or ethyl oleate. On the other hand, this was undesirable if a rapid absorption was required. In such cases it was preferable to administer the vitamin by mouth when fat absorption was impaired owing to diseases of the stomach and intestine or disorders of the liver and gall-ladder. Parenteral administration of vitamin A in aqueous dispersion offers no advantages and its use is not recommended.

GARTNER, R. J. W. & BURTON, H. W. (1957).

**Vitamin A in poultry: effects of vitamin deficiency.**—*Qd J. agric. Sci.* **14**, 189-216. 3687

Contrary to the findings of Polk & Sipe [*V.B.* **12**, p. 111], Rubin & Bird [*V.B.* **14**, 1317] and McClymont & Hart\* the results presented here demonstrated a marked drop in hatchability of eggs from pullets depleted of vitamin A. There was also a marked drop in egg production.

After field evidence of vitamin A deficiency was established the experiment was reversed. Egg production of pullets returned to normal two weeks after supplementation with vitamin A (stabilized vitamin A, 10,000 i.u./g.). Hatchability, which had fallen to *nil*, returned to normal one week after supplementation.

Chemical analyses for vitamin A in livers and egg yolks were made throughout the experiment. When vitamin A deficiency was first confirmed, eggs laid contained less than 8 µg. of vitamin A per yolk compared with 42 µg. from the controls.

Pullets on a vitamin A deficient ration survived for a maximum period of 39½ weeks after the deficiency had been established by chemical analysis. Mortality was high in chickens from eggs laid by vitamin A deficient pullets.

—L. HART.

\*McClymont, G. L. & Hart, L. (1948) *Aust. vet. J.* **24**, 5.

WORDEN, A. N. (1958). **The feeding of fresh and stored chick mashes containing cod-liver oil.**—*J. agric. Sci.* **50**, 340-343. [Author's summary modified.] 3688

Good quality cod-liver oil, produced by modern methods and containing anti-oxidants, is a highly satisfactory ingredient of the diet of young chicks whether fed fresh or stored as an ingredient of mixed mash for from 2½ to 3½ months before use at the recommended rate of 1 pint/cwt.

In each of two trials, chicks (hatched in early March and early December, respectively) so fed had better food conversion ratios and a better appearance than controls fed a comparable amount of vitamin A in powdered form. In the March chicks the liver vitamin A levels were slightly lower, and in the December chicks slightly higher, than in their respective controls.

It was concluded that both this form of cod-liver oil and the powdered preparation are reliable sources of vitamin A.

Chicks hatched in December grew better and maintained their vitamin A reserves longer than those hatched in March.

AZZONE, G. F. & ALOISI, M. (1958). **Changes induced by E-avitaminosis on the proteins of rabbit-muscle extracts.**—*Biochem. J.* **69**, 161-170. [Abst. from authors' discussion.] 3689

During the dystrophic changes in muscle fibres in vitamin E deficiency the proteins extractable at high ionic strength undergo various biochemical changes. Besides a considerable quantitative decrease of protein present in the extract (particularly of myosin) there is a clear-cut change in the composition of the different fractions obtained.

A characteristic and specific phenomenon during dystrophy is the appearance in quite large amounts of a component which precipitates at 12-16% saturation of ammonium sulphate in the salting-out curves. This component is present both in fractions I and II; in the latter it may constitute the major part of the fraction. When this component is found, as it always is in advanced dystrophy, it has a homogeneous electrophoretic behaviour in fraction II, whereas it is heterogeneous in fraction I and has a very slow mobility. The solubility properties of this component suggest that it is related to the myofibrillar proteins (its solubility in potassium chloride is rather similar to those of myosin and actomyosin) but in its electrophoretic mobility it is not comparable with any of the normal myofibrillar proteins so far studied.

BRO-RASMUSSEN, F. (1958). **The riboflavin requirement of animals and man and associated metabolic relations. Part II: Relation of requirement to the metabolism of protein**

and energy. — *Nutr. Abstr. Rev.* **28**, 369-386. **3690**

The second part of this useful and extensive review deals first with riboflavin in relation to protein metabolism and shows that the metabolism of this vitamin relies on the interdependence of utilization of riboflavin and protein. This is because the flavoproteins are in general the most labile proteins in the body. The relationships between riboflavin requirements and energy metabolism are discussed with especial attention to the requirements of this vitamin in man. Four tables and three figures are included. —E. J. CASTLE.

SKILLEN, R. G. (1958). A biochemical consideration of diabetes in the dog.—*N. Amer. Vet., Sect. 1, Amer. J. vet. Sci.* **39**, 45-51. **3691**

This paper surveys diabetes mellitus in the dog with reference to energy metabolism, and the biochemical basis of certain important symptoms and of the treatment. It is concluded that many cases of diabetes in dogs, particularly mild cases, are not diagnosed. It is suggested that more attention should be given to urinary sugar tests, which, if positive, would lead to further checks, and treatment of the diabetes rather than merely the associated symptoms.

—D. S. PAPWORTH.

WRIGHT, E. (1958). Goitrogen of milk produced on kale.—*Nature, Lond.* **181**, 1602-1603. **3692**

The milk of a goat fed on kale was given by stomach tube to rabbits treated with propyl thiouracil and radioiodine. The milk was found to contain 4.6 mg. thiocyanate per 100 ml. whereas milk produced from pasture contained only 0.8 mg./100 ml. Replacement of milk by water containing 4.6 mg./100 ml. of thiocyanate resulted in a discharge of iodine. Results suggested that the goitrogenic activity of milk from ruminants fed on kale is at least partly due to the presence of a thiocyanate-type goitrogen.

—D. S. PAPWORTH.

PIPES, G. W., PREMACHANDRA, B. N. & TURNER, C. W. (1958). A technique for estimation of the effectiveness of goitrogens in cattle. —*J. Anim. Sci.* **17**, 227-234. **3693**

A new technique for estimating the biological activity of goitrogens in intact cattle is described. Na  $I^{131}$  is injected intravenously and the rate at which thyroxine ( $I^{131}$ ) is released from the thyroid gland measured. When sufficient goitrogen is given it prevents the uptake of recycled  $I^{131}$  and there is an apparent increase in the rate of thyroxine discharge. No

difference in biological activity could be detected between thiouracil and 6-methyl-thiouracil.

In mature heifers and cows 1 g. of goitrogen per 100 lb. body wt. given every 24 hours was sufficient to prevent the uptake of recycled  $I^{131}$  completely, but in calves weighing 300-400 lb. more than 3 to 4 g. per 100 lb. body wt. were required.

Thyroxine is liberated at a constant rate for a period of 8-14 days under constant thiouracil administration, indicating that the thyroid has considerable powers of storing the preformed hormone.—E. J. CASTLE.

ANNISON, E. F. & LINDSAY, D. B. (1958). Acetate utilization in the sheep.—*Biochem. J.* **68**, No. 2, p. 33P of Proceedings. [Authors' abst. modified.] **3694**

The utilization of acetate by sheep was investigated using acetate labelled with radiocarbon, infused at a constant rate until the specific activities of plasma acetate and respired  $CO_2$  were constant. The quantity of carrier acetate infused was insufficient to affect the circulating levels of acetate.

Preliminary results indicated that at plasma concentrations of 0.4-0.5 m-mole/litre acetate utilization rates were 1.4-2.1 m-moles/hour/kg. body wt. Utilization rates do not distinguish between acetate immediately oxidized and that used for synthesis. The ratio of the specific activities of circulating acetate and respired  $CO_2$  under equilibrium conditions, showed that about 25% of the  $CO_2$  was derived from acetate. Measurement of total  $CO_2$  production allowed the percentage of the acetate utilized which appeared as  $CO_2$  to be calculated, and values of 45-50% were obtained.

Further experiments are in progress to investigate acetate utilization rates at enhanced concentrations of acetate. The constant infusion method is particularly suited to this purpose since the plasma concentrations can be adjusted to any desired level. Similarly, the influence of raised blood levels of other metabolites, such as glucose, can be studied.

JÖNSSON, G. (1958). Profylaxförsök vid paresis puerperalis. En litteraturöversikt och en redogörelse för egna resultat. [The prophylaxis of puerperal paresis in cows. —*Nord. VetMed.* **10**, 21-37. [In Swedish. English and German summaries.] **3695**

J. estimated that each year between 45 and 50 thousand cows had milk fever in Sweden. He tested the prophylactic action of a combination of vitamins  $D_2$ ,  $D_3$  and dihydrotachysterol, administered by i/m or i/v inj. as a single dose.



equivalent to 6 million units of vitamin D, during the last week of pregnancy. The incidence of milk fever in 28 treated cows was similar to that in untreated cows; treatment appeared to increase the incidence of retained placenta.

—R.M.

GOETSCH, G. D. (1957). **Studies on the production and treatment of experimental ketosis of ruminants.** — *Dissertation, Purdue Univ.* pp. 148. [Abst. from abst. in *Diss. Abstr.* 17, 2364-2365. (1957).] **3696**

The procedures used to produce ketosis were: (1) fasting of pregnant and non-pregnant adult ewes, (2) production of diabetes in ewes and lambs with alloxan, and (3) a combination of fasting and phlorhizin administration to pregnant and non-pregnant adult ewes.

Daily cortisone acetate administration was found to prevent the development of ketonaemia and hypoglycaemia as well as clinical signs of ketosis in fasted pregnant ewes. When cortisone administration was begun no reversal of these changes was seen. In these animals the appearance of clinical signs was prevented though the fasting was continued. The administration of cortisone acetate to non-ketonaemic alloxan-diabetic ewes rapidly increased blood ketones. No further increase was observed in cortisone treated diabetic lambs in which a ketonaemia was already present.

A reversal of the hypoglycaemia induced by fasting and phlorhizin administration in calves was seen following cortisone treatment. These animals also showed a marked increase in the intensity of the glycosuria and an apparent increase in urine nitrogen.

Attempts to reverse the hypoglycaemia and ketonaemia of fasted pregnant ewes by glucose, sodium malate or sodium lactate were unsuccessful. Clinical signs of ketosis continued in fasting animals in spite of the administration of these compounds.

Oral administration of sodium acetate to phlorhizin-treated fasted non-pregnant adult ewes did not alter the hypoglycaemia and slightly increased blood ketone levels. No effect on urine glucose and urea nitrogen excretion was observed. Sodium propionate when given orally to phlorhizin-treated fasted ewes rapidly reversed the hypoglycaemia and blood glucose remained at or above normal for 24 hours after treatment. Blood ketone levels were depressed. The intensity of the phlorhizin-induced glycosuria was markedly increased during the subsequent 48 hours.

Sodium butyrate when given orally to fasted phlorhizin-treated non-pregnant ewes markedly increased blood ketones, significantly reduced blood glucose, and depressed the amounts of glucose, urea nitrogen and total nitrogen in urine.

## DISEASES, GENERAL

WITHERS, F. W. (1958). **Wastage and incidence of disease in dairy herds.** — *Agric. Rev., Lond.* 3, 18-22. **3697**

W. described the working of a survey of losses amongst dairy cattle organized by the Ministry of Agriculture and operating in 9 counties of the United Kingdom. Results so far obtained were summarized. [See also *V.B.* 27, 2782.] —R.M.

PIRES, A. (1958). **Contribucion a la etiologia y tratamiento del ronquido laríngeo del caballo. [Aetiology and treatment of laryngeal stenosis in horses.]** — *Cienc. vet. Mexico* 3, 124-134. **3698**

P. stated that it was erroneous to assume that the majority of cases of roaring in horses was caused by paralysis of the recurrent laryngeal nerve. More frequent causes were inflammatory processes in the larynx, particularly in race-horses. Diagnosis and treatment were discussed. Spraying the laryngeal mucosa with procaine soln. was an aid to differential diagnosis, as well

as providing temporary relief from laryngeal spasm. —R.M.

RAINEY, J. W. (1958). **A bovine respiratory disorder believed due to seed of wild white clover (*Trifolium repens*).** — *Vet. Rec.* 70, 167-168 & 169. **3699**

Over a period of 15 years several outbreaks of acute pulmonary oedema occurred in dairy herds in Tasmania. The condition was severe but seldom fatal and recovery occurred within 3 weeks. Milk yield ceased or was much reduced during illness. It occurred only in late summer or early autumn when a lush period with heavy growth and ripening of wild white clover was followed by a hot, dry spell. The cause of the condition was unknown. Various treatments including antibiotics and anti-allergic drugs were tried but none hastened recovery. —R.M.

ROMBOLI, B. & BOTTI, L. (1958). **Rilievi istopatologici sul sistema di conduzione in corso di "adipositas cordis" nel bovino.** [*Histo-*

**pathological study of the Purkinje fibres in cardiac adiposity of cattle.]—*Atti Soc. ital. Sci. vet., Rimini-Ravenna* 1957, 11, 718-721. [Summaries in English and French.] 3700**

The histological changes in the Purkinje fibres are described.—T.E.G.R.

SCHÉELE, R. (1957). Querschnittsmessungen von Herzmuskelfasern bei Schwein, Pferd und Hund im Hinblick auf einen ursächlichen Zusammenhang mit dem plötzlichen Herztod des Schweines. [Diameter of heart muscle fibres in pig, horse and dog. A possible basis for the predisposition of pigs to fatal syncope.]—*Inaug. Diss., Munich* pp. 53. 3701

S. agreed with the suggestion of Spörri [*Zbl. VetMed.* 1, 799 (1954)] that the relative thickness of heart muscle fibres in pigs might be the cause of their predisposition to fatal syncope.

—R.M.

LIGHT, F. W., JR. & BENBROOK, S. C. (1958). Subendocardial hemorrhages of the left ventricle following trauma in goats.—*Arch. Path.* 65, 407-414. [Authors' summary modified.] 3702

Subendocardial haemorrhages of the left ventricle were found at P.M. examination in 22% of 514 experimentally wounded goats. Of the 326 animals dying from their wounds within 48 hours, 29% had such haemorrhages. Haemorrhages were found less frequently in goats dying in under 5 min. or killed after surviving 48 hours. They were commonest in animals surviving more than 5 min. but dying within 24 hours, occurring in as many as two-thirds of those dying between 30 and 60 min. after wounding. Their incidence did not vary appreciably among goats with wounds of various anatomical regions or organs, and they were, in particular, no commoner after wounding of the brain or spinal cord than after wounding of other organs. They appear to be a non-specific response to severe injury. In most cases they probably occurred within 30 min. of injury. Anatomical findings implicating direct stimulation of the vagus nerve in the pathogenesis of the haemorrhages were encountered in only a few goats.

BRION, A. J. & FONTAINE, M. P. (1958). Étude sur la rhinite atrophique du porc. Les lésions nerveuses, Essai d'interprétation étiologique et pathogénique. [The lesions of the nervous system in porcine atrophic rhinitis.]—*Canad. J. comp. Med.* 22, 88-95. [In French.] 3703

The authors have carried out a bacterio-

logical and histopathological study on a number of sows affected with atrophic rhinitis and on their piglets, which contracted the disease and were examined P.M. at various ages. Antibodies for viruses of the psittacosis-lymphogranuloma group were demonstrable in the serum of the sows. Also in various organs of the sows and their piglets, intracellular and extracellular bodies were found which possessed the morphological and staining characteristics of the so-called "neo-rickettsia". The authors state that, histopathologically, the initial lesion of the disease occurs in the nerves that serve the nasal region. The turbinate atrophy follows vascular obliterations without inflammatory processes. The nervous lesions may be produced by various aetiological agents.

While it is true that, in the first days of life, piglets can become infected by external contamination, the authors showed that, in some cases, the disease is congenital. Such an infection may also cause abortion and stillbirth.

—C. L'ECUYER.

O'CONNOR, D. (1958). Haemorrhage of unknown origin in pigs.—*Irish vet. J.* 12, 28-30. 3704

Listlessness, refusal to eat and drink, sub-normal temp., pallor of the mucous membranes, with death 12-24 hours after the first appearance of symptoms, were observed in a herd of pigs. Cases occurred one or two at a time, at intervals varying from a week to a month. P.M. examination consistently revealed a large clot of blood in the lumen of the stomach. Life could be prolonged for a few days by the injection of vitamin K, and cures were obtained by the parenteral administration of a coagulant ("Noracin"). The possibility that excess dietary phosphorus was the cause is discussed.—M.G.G.

LIÉGEOIS, F. & DEPELCHIN, A. (1958). Un cas d'insuffisance surrénale chez le chien. Valeur diagnostique de certaines constantes sanguines. [Adrenal insufficiency in a dog.]—*Ann. Méd. vét.* 102, 79-88. 3705

Apathy, poor appetite, increased thirst and progressive emaciation in a 6-year-old bitch were associated with sclerosis of the adrenal glands. The number of eosinophiles in peripheral blood was 2,856/cu.mm.—R.M.

TOTTON, M. (1958). Ringtail in new-born Norway rats. A study of the effect of environmental temperature and humidity on incidence. — *J. Hyg., Camb.* 56, 190-196. [Author's summary.] 3706

Ringtail in infant rats is shown to depend



on humidity over a wide temperature range. It is not due to infection or diet, but probably to chronic cooling by evaporation, convection and conduction.

Rats should either be bred in cages with solid floors, or else be given environmental conditions resembling those in the natural nest, which keep the young at a low saturation deficit during the early post-natal period.

SILBERBERG, R., GOTO, G. & SILBERBERG, M. (1958). **Degenerative joint disease in castrate mice. I. Effects of ovariectomy at various ages.**—*Arch. Path.* **65**, 438-441. 3707

SILBERBERG, R., THOMASSON, R. & SILBERBERG, M. (1958). **Degenerative joint disease in castrate mice. II. Effects of orchietomy at various ages.**—*Ibid.* 442-444. [Authors' summaries modified.] 3708

I. In female mice castration at 1, 6, or 12 months of age retarded articular aging and delayed the onset, decreased the incidence, and attenuated the course of osteoarthritis as compared with controls. These effects were most marked in animals spayed early in adult life. Endogenous ovarian hormones thus do not protect the joints of the female mouse against the development of degenerative joint disease. The lower susceptibility of the female to osteoarthritis as compared to that of the male can therefore not be accounted for by ovarian activity.

II. Orchietomy in immature male mice delayed articular aging and attenuated the course of osteoarthritis as compared with controls. Orchietomy in adult male mice was less effective.

VAN MIDDLESWORTH, L. (1958). **Iodine-131 in sheep before and after a nuclear reactor accident.**—*Nature, Lond.* **181**, 256. 3709

Levels of iodine-131 in thyroids of unselected sheep slaughtered in London before and after the Windscale accident were compared with  $I^{131}$  levels of sheep slaughtered in Munich and Tennessee. Results suggested that most of the iodine in the German sheep originated west of Tennessee, and that the London animals received less from the Windscale incident than Tennessee sheep have received from distant nuclear weapons tests. It was concluded that continuous monitoring of thyroids from sheep and cattle provided a good indication of concentration of air-borne radioactive fall-out.

—D. S. PAPWORTH.

PHILIPSON, L. & LAURELL, G. (1958). **Treatment of post-irradiation infections in mice. 3. Studies on the endogenous bacteraemia asso-**

**ciated with ionizing radiation.**—*Acta path. microbiol. scand.* **43**, 62-72. [In English. Authors' summary modified.] 3710

Mice exposed to 550 to 600 r were treated with terramycin plus neomycin with or without streptomycin. Treated animals had a lower incidence of endogenous bacteraemia than untreated controls, but mortality and period of survival were similar. This suggests that infection is not an important factor in the mortality associated with high doses of radiation. No increase in the numbers of strains resistant to antibiotics was noted during treatment. The endogenous bacterial invasion was most marked during the 2nd to 5th days after irradiation, and appeared to continue until the 15th day. [See also *V.B.* **28**, 2616.]

ZWEIFACH, B. W., GORDON, H. A., WAGNER, M. & REYNIEERS, J. A. (1958). **Irreversible hemorrhagic shock in germfree rats.**—*J. exp. Med.* **107**, 437-450. [Authors' summary modified.] 3711

Evidence is provided that a state of irreversible haemorrhagic shock can be induced in rats reared germ-free. The response to bleeding, the duration of the hypotensive episode and the pathological changes were the same in the germ-free and in normal stock rats. The findings are considered to oppose the concept that bacteria or bacterial products are primarily implicated in the pathogenicity of shock.

JONES, J. E. T. (1958). **Skin: General pathological considerations.**—*Vet. Rec.* **70**, 175-176. 3712

An approach is suggested in general terms to the problems of diagnosing and understanding the causes of skin diseases in small animals.

—W. E. PARISH.

CREED, R. F. S. (1958). **The histology of mammalian skin, with special reference to the dog and cat.**—*Vet. Rec.* **70**, 171-175. 3713

A well ordered and informative account of the histology of the skin of mammals with particular reference to the dog and cat.

—W. E. PARISH.

KRAL, F. (1958). **Use of polythionates and sodium thiosulfate in seborrheic disorders.**—*Vet. Med.* **53**, 313-318. 3714

Thirty-two dogs, three cats and two horses presenting generalized seborrhoea, localized seborrhoea or seborrhoeic dermatitis were treated by the systemic administration of sodium thiosulphate and/or topical application daily of

polythionates in stabilized aqueous solution or in a specially prepared vanishing cream vehicle, with excellent results.—R.M.

GRAUWILER, J., SPÖRRI, H. & WEGMANN, H. (1958). Zur graphischen Ermittlung des systolischen und diastolischen Blutdruckes bei Haustieren mittels des Infratonmikrophons und Druckmarkengebers von Brecht und Boucke. [**Graphical recording of systolic and diastolic blood pressure in animals by an indirect method.**]—*Schweiz. Arch. Tierheilk.* **100**, 297-318. [Summaries in English, French and Italian.] **3715**

The method was that used on human beings by Brecht & Boucke [*Münch. med. Wschr.* **97**, 112 (1955)]. The apparatus consisted of two parts (1) an inflatable cuff connected to a mercury manometer: the height of the mercury column was measured with the aid of electrical contacts set in the wall of the manometer tube, and pulse recordings were obtained by feeding current from the contacts into an electrocardio-

graph or a cathode ray oscilloscope; (2) a special microphone replacing auscultation by stethoscope. Measurements were made on horses, cattle, pigs and dogs and the results are tabulated.—R.M.

VEENENDAAL, H. (1958). Mededelingen uit de veterinaire oogheelkundige afdeling. [**Notes on veterinary ophthalmology.**]—*Tijdschr. Diergeneesk.* **83**, 329-344. [In Dutch. Summaries in English, French and German.] **3716**

The following cases were recorded:—enlargement of the anterior chamber of one eye in a calf; bilateral globular cornea in a fowl; spontaneous improvement of detached retina in a dog; TB. of one eye in a peacock; recovery following accidental application of lysol to the cornea of a dog; exophthalmus and strabismus convergens in a cow; neoplasm of the ciliary body in a dog; recurrent haemorrhage in the anterior chamber in a dog; treatment of protruding nictitating membrane of cat with naphazoline.—R.M.

See also abst. 3809 (book, genetic resistance to disease).

## POISONS AND POISONING

CLARKSON, T. W. & KENCH, J. E. (1958). **Uptake of lead by human erythrocytes in vitro.**—*Biochem. J.* **69**, 432-439. [Authors' summary modified.] **3717**

Lead appears to exist in plasma as a peptized lead phosphate sol, which is rapidly aggregated on the surface of the erythrocytes. More than 95% of small quantities of added lead are rapidly attached to the cells.

No competitive inhibition of uptake of lead was observed with any of a number of potential competitors tested including other heavy metals, copper, mercury, uranium and thallium ions.

Chelating agents such as ethylenediamine-tetra-acetic acid, hexametaphosphate and glutathione remove lead attached to erythrocytes only slowly *in vitro*; intracellular lead was not withdrawn.

It is suggested that the protective effect of plasma and of other solutions containing excess of phosphate is due to a charge effect on the lead phosphate sol, leading to additional negative charge on the erythrocyte.

MORGAN, A. T. & WILLIAMS, E. I. (1958). **Arsenico-phenol poisoning in a dairy Short-horn herd.**—*Vet. Rec.* **70**, 99-100. **3718**

Acute poisoning affected 13 of 28 cows in a herd and 10 of them died. 12 hours previously a "fly dressing" had been applied to the backs of the cows at the rate of about 4 oz. for each

animal. Subsequent analysis revealed that the dressing contained 7.32% arsenic (as  $As_2O_3$ ), 10% phenols and 5.8% sodium carbonate in water. Milk from the 15 apparently normal cows was analysed, and on the first day it contained 2 p.p.m. arsenic; 4 days afterwards it contained 0.6 p.p.m. but no arsenic was present 10 days after the incident.—R.M.

MOUNTER, L. A. & SHIPLEY, B. A. (1958). **The inhibition of plasma by toxic phosphorus compounds.**—*J. biol. Chem.* **231**, 855-861. [Authors' summary.] **3719**

It has been demonstrated that plasmin, the proteolytic enzyme of serum, is inhibited by toxic organophosphorus compounds of the diisopropyl fluorophosphate type. Plasminogen, the inactive precursor of plasmin, is not affected by diisopropyl fluorophosphate.

Differential inhibition provides additional distinction between plasmin and trypsin.

CORNISH, H. H. & BLOCK, W. D. (1958). **Metabolism of chlorinated naphthalenes.**—*J. biol. Chem.* **231**, 583-588. [Authors' summary modified.] **3720**

The results indicate that the rabbit can metabolize naphthalene, 1-chloronaphthalene, and dichloronaphthalene. Tetrachloronaphthalene is metabolized to a lesser extent. In each case the major excretory product is a glucosi-



duronic acid. More highly chlorinated naphthalenes did not yield urinary metabolites which could be detected by the procedures used in this study.

A correlation exists between the extent to which chlorinated naphthalenes are metabolized and excreted and the known toxicity of these compounds.

HARVEY, D. G. (1958). **Some aspects of the metabolism of 4 : 6-dinitro-o-cresol (DNC) by the ruminant.** — *J. comp. Path.* **68**, 54-63. 3721

DNC is the most important of a group of dinitrophenol derivatives which are used for controlling weeds in cereal or pea crops, and as winter washes for fruit trees. H. studied the effect of isolated rumen contents on DNC, and the amount of DNC in the blood of ruminants following oral or intraperitoneal administration of single doses. It was concluded that rumen contents were potentially good detoxicating media for DNC, but it was possible that continuous exposure to low concentrations of DNC may disturb essential biochemical processes of the rumen organisms and therefore may indirectly disturb the health of the host. The rumen was not the only portal of entry of DNC into the bloodstream: a limited number of experiments indicated that some absorption occurs through the buccal mucosa, the upper oesophagus and possibly the lips. An even greater source of danger was inhalation of a DNC aerosol from wind-blown spray. From the safety point of view the same measures that are employed in safeguarding human beings should be applied to farm animals: precautions should be taken to prevent exposure, and when DNC compounds have been used, blood samples should be analysed.

—R.M.

PEREK, M. (1958). **Ergot and ergot-like fungi as the cause of vesicular dermatitis (sod disease) in chickens.** — *J. Amer. vet. med. Ass.* **132**, 529-533. [Author's summary modified.] 3722

Vesicular dermatitis of chickens was produced by feeding ergot to healthy birds. *Lolium temulentum* seeds, infested with the common fungus *Cladosporium herbarum*, had an ergot-like action and vesicular disease resulted when they were fed to chickens. The disease could not be produced by *L. temulentum* which was not infested with this fungus.

*Staphylococcus pyogenes* isolated from the vesicles of affected birds did not produce the disease.

ANON. (1958). **Reducing livestock losses from plant poisoning in the Western States.** — *U.S. Dep. Agric. Pamphlets* PA 315-PA 330. 3723

This is a series of 16 pamphlets for owners of livestock. Each deals with one plant and bears a colour plate of the plant. Information concerning its geographical distribution, habitat, and effects on livestock is summarized. The plants dealt with are arrowgrass, bracken fern, chokecherry, copperweed, death camas, greasewood, halogeton, horsebrush, larkspur, locoweed, lupine, milkweed, oak brush, rubberweed, sneezeweed, water hemlock. —R.M.

VANĚK, J. (1958). Vergiftung mit Kreuzkraut (Senecio) als Ursache der Zdárer Pferde-seuche. [Poisoning with *Senecio erraticus* as the cause of Zdár disease of horses.] — *Schweiz. Z. allg. Path.* **21**, 821-848. 3724

A detailed account largely based on Czechoslovak literature, illustrated by 12 photomicrographs of liver lesions. It now appears to be established that senecio poisoning is the cause of this disease. [See also *V.B.* **28**, 1193.] —R.M.

BEGOVIĆ, S., JANJATOVIĆ, M., KOZIĆ, Lj. & NEŠIĆ, P. (1957). Klinička i patološka slika alimentarne intoksikacije goveda napasanih u hrastovim šumama. [Poisoning of cattle by oak leaves.] — *Vet. Glasn.* **11**, 673-679. [In Croat. German summary.] 3725

Poisoning with oak leaves was described in 56 cattle, 25 of which died. Marked anaemia with anisocytosis and poikilocytosis was a feature. —E.G.

EVANS, W. C., EVANS, I. A., THOMAS, A. J., WATKINS, J. E. & CHAMBERLAIN, A. G. (1958). **Studies on bracken poisoning in cattle. Part IV.** — *Brit. vet. J.* **114**, 180-198. [Authors' summary modified.] 3726

Bracken poisoning in cattle could not be induced by feeding a purified bracken thiaminase preparation or other sources of this enzyme. Toxopyrimidine introduced into the rumen of an ox did not cause bracken poisoning. In sufficient dose it precipitated convulsive seizures, reminiscent of induced pyridoxine deficiency in other animals. The rumen flora of a bullock fed on bracken showed a trend towards increased coliform counts, decreased lactobacilli and slightly diminished streptococcal counts. Water extraction of bracken gave equivocal results. Neither the deproteinized water extract nor the bracken residue had much activity. Ether or acetone, at room temp., failed to extract the poison; the bracken residues, however, remained fully active. The condition was reproduced by

feeding a fraction of bracken soluble in ethanol. This eliminates thiaminase as the causative agent, and establishes that it is another substance, extractable by hot ethanol.

FENG, P. C. & PATRICK, S. J. (1958). **Studies of the action of hypoglycin-A, an hypoglycaemic substance.**—*Brit. J. Pharmacol.* **13**, 125-130. [Authors' summary modified.] **3727**

Some biological effects of hypoglycin-A, a compound isolated from the fruit of *Blighia sapida*, were investigated. Administration to animals caused drowsiness progressing to coma, and, when large doses were given, death. For the rat, the oral and intraperitoneal  $LD_{50}$  values were 98 and 97 mg./kg. respectively. The most

outstanding biochemical change produced by hypoglycin-A was a delayed hypoglycaemia, the depth of which was related to the dose. The authors suggested that the primary action of hypoglycin-A is the interference with glycogen production by the liver. [See also *V.B.* **28**, 1569.]

SHOSHAN, A. (1958). [The snake in ancient times and to-day.] — *Refuah vet.* **10**, 9-12. [In Hebrew. Abst. from English summary p. 48.] **3728**

Between 1949 and 1956 there were in Israel 194 cases of snake-bite in cattle (43 fatal); 56 cases in horses, donkeys and mules (25 fatal); 33 in sheep and goats (10 fatal).—R.M.

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

SHAKOLOV, K. I. (1957). [Pathogenetic therapy in diseases of animals.] pp. 318. Moscow & Leningrad: Gosud. izd. sel'skokhoz. lit. 6r. 70k. (6s.) [In Russian.] **3729**

"Pathogenetic therapy" is defined as all forms of therapy which act on the body by way of the nervous system, increasing its reactive and defensive properties: it is, in fact, non-specific therapy. The novel features of this book are procaine therapy and tissue therapy. Included in the former are accounts of epipleural and paranephral nerve block and blockade of the bovine mammary gland. These techniques have received great attention in the U.S.S.R. during the past few years, and relatively little attention elsewhere. There are also chapters on physical methods of treatment and on the role of nervous factors in the treatment of diseases of joints and tendon sheaths. Each chapter has a bibliography of Russian literature.—R.M.

ANON. (1958). **Leucocyte agglutinins and blood transfusions.** — *Lancet* February 15th, 359-360. **3730**

Agglutinins causing aggregation and possibly destruction of leucocytes have been studied for only a few years and it has been suggested that leucocyte agglutinins may be responsible for transfusion reactions.

The leucocyte agglutinins so far studied have all been iso-agglutinins—no reaction with the leucocytes of the patient, only with leucocytes of other persons. Autoleucoagglutinins have not been demonstrated.

Leucocyte agglutinins are relatively thermostable, can be preserved by freezing, and are probably gamma-globulins. They are most

active at 37°C. and over a wide range of pH, from 6.5 to 9.2. They agglutinate normal and pathological granulocytes and lymphocytes, and can be absorbed from serum by leucocyte suspensions. Serum contains a thermolabile factor which inhibits leucoagglutinins and is destroyed at 56°C. for 30 min. Leucoagglutinins can be transferred passively and their immune nature seems established.

In small-scale work reported the injection of leucoagglutinin caused a rapid profound fall of the white cell count, whereas no such effect followed the injection of normal serum. Erythrocyte "ghosts" have been demonstrated in the leucocyte clumps.

Leucoagglutinins appear to be present in the serum of a miscellaneous group of persons many of whom had had multiple blood transfusions. The presence of isoleucoagglutinin in a patient's serum constitutes an additional factor for consideration in transfusion reactions.

—W.A.P.

NELSON, A. J. (1958). **Promazine. A clinical note.**—*Vet. Med.* **53**, 356 & 360. [Author's summary modified.] **3731**

The effectiveness of oral promazine hydrochloride in the control of canine hyperexcitability was substantiated. Nine of 11 sows exhibiting hysteria at farrowing responded favourably to i/m administration of promazine hydrochloride in doses ranging from 100-200 mg.

HANSSON, C.-H. (1958). **Anaesthesia in the dog using short-acting barbiturate and nitrous oxide supplemented with succinylcholine iodide and positive-negative artificial respira-**



tion. — *Nord. VetMed.* 10, 407-425. [In English. Summaries in German and Swedish. Author's summary modified.] **3732**

A method for general anaesthesia in dogs has been developed, where morphine-scopolamine-atropine have been used as preanaesthetic agents, thiopentone as inducing, nitrous oxide as anaesthetic and succinylcholine iodide

See also absts. 3470 & 3477 (mastitis); 3484 (TB.); 3543 (suramin complexes); 3545 (rabbit coccidiosis); 3549-3553 (bovine theileriosis); 3600 (antiviral chemotherapy); 3615-3620 (parasitocides); 3622, 3636-3637 & 3639-3640 (anthelmintics); 3664-3665 (antibiotic food supplements); 3714 (seborrhoea).

## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

DOWLING, D. F. (1958). The significance of sweating in heat tolerance of cattle. — *Aust. J. agric. Res.* 9, 579-586. [Author's summary modified.] **3733**

Cattle were covered with polyethylene coats, which prevented the vaporization of skin moisture from the body surface, and then exposed to high atmospheric temperatures. Significant differences ( $P < 0.001$ ) between their rectal temperatures and those of the control animals were demonstrated.

It is concluded that, in conditions of high air temperature and radiation and low humidity, differences in heat tolerance between one animal and another may be due to differences in the ability to dissipate heat by vaporization of sweat on the skin surface.

ANON. (1958). Thyroids and heat tolerance. — *Agric. Res., Wash.* 7, No. 2 p. 7. **3734**

This is a brief report of work done by M. H. Conner, H. Menge and H. Ota at the Agricultural Research Center, Beltsville, Maryland. Two lines of chicks, specially bred for difference in size of thyroid gland, were continually exposed from hatching to 4 weeks of age to temperatures ranging from 95° to 100° F. Birds having large thyroids suffered less mortality and grew better than those with small thyroids. The adrenal glands of the latter were enlarged.

—R.M.

DALE, H. E., RAGSDALE, A. C. & CHU SHAN CHENG. (1958). Effect of environmental temperature on time of puberty in beef calves. — *Fed. Proc.* 17, 31. **3735**

Groups of Santa Gertrudis, Brahman (zebu), and Shorthorn calves were reared at constant environmental temperatures of 50° and 80° F., 50-70% relative humidity with equal periods of light and dark, with control in open sheds. All calves were polyoestrous except one of the 50° F. Brahman and the outdoor Brahman which were seasonally mono-oestrous. 80° F. Brahman reached puberty at a mean age

as a muscular relaxing agent. Artificial respiration was given with the aid of an automatic positive-negative pressure apparatus. Compared with intravenous barbiturate anaesthesia and epidural anaesthesia with chlorpromazine as premedication, this anaesthesia seemed to maintain more physiological conditions than the other two forms.

of 463 days whilst the mean ages of all other groups were between 290-440 days. At puberty, 80° F. Brahman had achieved a mean of 60% of the predicted mature (PM) weight compared with means of 39-45% for all others, a mean of 95% of PM withers height compared with means of 80-83% for all others, and a mean of 84% of PM chest girth compared with 69-75% for all others. The 50° F. Shorthorns reached puberty slightly earlier than the 80° F. Shorthorns but both groups were older and larger at puberty, absolutely and relative to PM values, than were outdoor Shorthorns. —A. ACKROYD.

HEITMAN, H., JR., KELLY, C. F. & BOND, T. E. (1958). Ambient air temperature and weight gain in swine. — *J. Anim. Sci.* 17, 62-67. **3736**

In 24 trials with 94 pigs, each trial lasting about 7 days, a correlation was observed between weight and the most beneficial environmental temp. Pigs weighing 350 lb. gained most at a constant air temp. of 61° F., whereas pigs weighing 100 lb. gained most at 73.5° F.

—M.G.G.

EMEL'YANOV, S. V. [Edited by.] (1957). [Problems of individual growth of farm animals.] — *Trud. Inst. Morfologii Zhivotnykh* No. 22. [In Russian.] Moscow: Izd. Akad. Nauk SSSR. 13r. 70k. (11s.) **3737**

This volume of collected works contains the texts of 26 papers read at a conference devoted to growth in farm animals, held at the "A. N. Severtsov" Institute of Animal Morphology in 1954. The first 8 papers dealt with general questions of embryonic and post-embryonic growth and the remainder dealt with individual species of animals. Those concerning cattle discussed metabolic relationships between cow and foetus, skeletal development, and embryonic development of the udder. With sheep the emphasis was on breed differences in growth. Two papers dealt with pigs: one on the influence of nutrition of the sow on development of foetus, and the other on development of subcutaneous fat. Other

papers discussed age changes in blood proteins of horses, nutrition of the mare in relation to embryonic growth of the foal, and incubation of poultry eggs.—R.M.

GHADIALLY, F. N. (1958). **Effect of trauma on growth of hair.** — *Nature, Lond.* **181**, 993. **3738**

G. has often observed that simple mechanical trauma of the skin of the rabbit, such as scratching or cutting, causes a sudden growth of hair around the site of injury. The effect is most striking in the quiescent phase of the cycle of hair growth, when a clipped area of undamaged skin may remain free from hair for as long as 3-4 months. He suggests that this effect may explain the local stimulation of hair growth in the rabbit by ionizing radiations and by some nitrogen mustard derivatives.—M.G.G.

MEMMEL, H. (1957). **Papieroelektrophoretische Untersuchungen am Kammerwasser des Rindes mit Hilfe der Gefriertrocknung. [Paper electrophoresis of aqueous humour of cattle, with the aid of freeze-drying.]—Inaug. Diss., Munich pp. 45.** **3739**

M. examined freeze-dried samples of aqueous humour from 164 eyes from healthy slaughtered cattle. Average protein composition was 43.7% albumin, 13.3% alpha globulin, 21.3% beta and 21.3% gamma globulin. Aqueous humour from single cases of microphthalmia and iritis was also examined.—R.M.

GREENSTEIN, J. S. & FOLEY, R. C. (1958). **Early embryology of the cow. I. Gastrula and primitive streak stages.** — *J. Dairy Sci.* **41**, 409-421. [Authors' summary modified.] **3740**

Serial sections of 16 embryos from cows slaughtered at 16, 17 and 18 days after insemination were studied to establish standards of normal development and to define normal variation during early pregnancy. The 16-day-old blastocysts were engaged in the processes of gastrulation, and ranged in development from a hollow bilaminar sphere to an elongate chorionic vesicle with an elevated germinal disk. Their principal features were the remarkably rapid growth of the trophoblast and the differentiation of somatic and splanchnic mesoderm. Blastocysts recovered at 17 days were characterized by further growth, cephalocaudal elongation of the germinal disk, and differentiations of Hensen's node and the primitive streak establishing the longitudinal axis. In the 18th day of development, the blastocysts extended throughout the major portion of the gravid horn and the embryos had well-defined primitive node, primitive groove

and notochord development. Amniogenesis was initiated and, in two specimens, completed amniotic sacs were present. Two cases of probable embryonic death were found in which the trophoblast persisted after loss and resorption of the embryonic area. The morphogenetic processes involved in gastrulation and primitive streak formation are considered in the light of reported high embryonic death during early pregnancy.

RENZONI, A., MORICONI, A. & LORVIK, S. (1958). **La fosfatasi alcalina nel tratto intestinale di alcuni animali domestici. [Alkaline phosphatase in the intestinal tract of domestic animals.]—Atti Soc. ital. Sci. vet., Rimini - Ravenna 1957. 11, 674-679. [Summaries in English and French.]** **3741**

A comparative study of the alkaline phosphatase in the small intestine, the large intestine and the rectum of the sheep, the horse and the ox led to the conclusions that: alkaline phosphatase activity is high in the small intestine, mediocre in the large intestine and low in the rectum; in all the sections examined it was particularly evident in the epithelial cells, poor in the mucosal glands and absent in the submucosal glands; in unweaned animals both individual and species variations were negligible; in adult animals on the other hand, there were marked differences between species and even more marked differences between individuals of the same species; the variations among individuals of the same species were presumably due to individual physiological variations.—T.E.G.R.

CROSS, B. A., GOODWIN, R. F. W. & SILVER, I. A. (1958). **A histological and functional study of the mammary gland in normal and agalactic sows.** — *J. Endocrin.* **17**, 63-74. [Authors' summary modified.] **3742**

Using a method they had devised for obtaining repeated biopsy samples from the mammary glands of sows, the authors studied the histological changes associated with farrowing. Before farrowing, the alveoli were at first small and filled with a hyaline eosinophilic secretion. Progressive distension of the alveoli followed, accompanied by a gradual replacement of the eosinophilic material by basophilic secretion and the onset of fat secretion. At farrowing the alveoli were contracted and their contents evacuated. Acute involutional changes in the engorged glands of sows whose litters were weaned early; or sows in which one teat had been occluded during suckling, were characterized by solidification of the alveoli, swollen degenerating epithelial cells and, later, stromal proliferation.



Little alveolar structure remained after 8 days.

Descriptions are given of three main types of mammary defect that were detected histologically in clinical cases of agalactia.

In experiments on milk ejection, recorded manometrically, the dose-response relation to injected oxytocin was determined. Two out of three sows responded to 10 milliunits and maximal responses were obtained with doses of 200–300 milliunits.

The occurrence of myoepithelial cells in the sow's mammary gland was demonstrated by the alkaline phosphatase technique.

SLATER, T. F. & PLANTEROS, D. N. (1958). **Studies on the particulate components of rat mammary gland. 4. The distribution of ribonucleic acid.**—*Biochem. J.* **69**, 417–421. [Authors' summary modified.] **3743**

The distribution of total protein and ribonucleic acid phosphorus (RAP) in five fractions of the rat mammary gland was determined at three stages of the lactation cycle: on the 20th day of pregnancy and on the 3rd and 18th days of lactation.

At the end of pregnancy, RAP is largely localized in the 'soluble' fraction of the mammary gland. Lactation produces a redistribution of total RAP such that the majority of it is found in the smaller particulate fractions of the tissue suspension.

Lactation produces a relative increase in the amount of protein associated with the smaller particulate fractions at the expense of the 'large-particle' fraction. All these fractions, however, show an increase in total amount from late pregnancy to late lactation.

The ratio of RAP to total protein is low in all fractions in late pregnancy but has risen to a high value in the 'small-particle' fraction by the end of lactation.

KCHOUK, M. & DURAND, M. (1958). Quelques dosages chimiques dans le sang des dromadaires en Tunisie. [**Composition of the blood of camels in Tunisia.**]—*Arch. Inst. Pasteur Tunis* **35**, 3–37. **3744**

Blood values of camels in different regions of Tunisia were studied. Ca and P were low in animals on pastures rich in mineral salts, and high in regions poor in P. The Ca/P ration was about 1.3. In lactating females Ca was low but P was not greatly affected. The average alkaline phosphatase level was 1.6 mg./100 ml. Proteins averaged 85 g./litre, slight variations being observed in different regions. Protein fractions, assessed by paper electrophoresis, averaged: albumin,  $41.5 \pm 4\%$ ; globulins— $\alpha^1$   $4.8 \pm 1.2\%$ ;

$\alpha^2$   $9.3 \pm 2\%$ ;  $\beta$   $17.2 \pm 1.5\%$ ;  $\gamma$   $27.3 \pm 3\%$ . Cl values were constant and showed no regional variations. The N content in all regions averaged 0.48 g./litre. The cholesterol level was about 0.4 g./litre. From results obtained it appeared that the cholesterol level decreased with age and was higher in females. Sugar values averaged 0.83 g./litre.—T.E.G.R.

ALIEV, F. A. (1958). [**Effect of unusually low temperature on some physico-chemical properties of the blood in sheep.**]—*Proc. Lenin Acad. Agric. Sci.* **23**, No. 4 pp. 37–40. [In Russian.] **3745**

In the first of 2 series of experiments, 8 sheep were exposed to moderate cold ( $0^\circ$  to  $4^\circ\text{C.}$ ) for 2–4 days. In the second series 6 sheep were exposed to severe cold (from  $-10^\circ$  to  $-20^\circ\text{C.}$ ) for the same period. The animals were examined clinically twice daily and blood was sampled once daily. Both degrees of cold resulted in increased erythrocyte sedimentation rate, increase in resistance of erythrocytes, reduction in alkali reserve, increased catalase activity and prolonged clotting time. [Figures for these and other properties are tabulated.] It was stated, without evidence being given, that sheep became accustomed to repeated exposure to severe cold and changes in the blood gradually ceased to occur.—R.M.

MONDINI, S. & VENTUROLI, M. (1958). Il lipidogramma normale di cane. [**Serum lipids in dogs.**]—*Atti Soc. ital. Sci. vet., Rimini-Ravenna* **1957**, **11**, pp. 341–344. [Summaries in English and French.] **3746**

Paper electrophoresis of normal dog serum revealed three lipoprotein fractions, referred to as  $\alpha$ ,  $\beta$  and  $\gamma$ . The  $\alpha$  fraction was the greatest. The cholesterol and phospholipid contents per 100 litres were 243 mg. and 455 mg. respectively, contained mostly in the lipoproteins.

—T.E.G.R.

WEHN, P. S. (1957). **Pulsatory activity of peripheral arteries.**—*Scand. J. clin. Lab. Invest.* **9**, Suppl. No. 30, pp. 106. [In English. Summaries in Spanish and Russian.] **3747**

A new theory of arterial circulation is presented. The circulation is accelerated by contraction of the arteries. The systolic rise in pressure spreads so rapidly that it affects the entire arterial tree almost simultaneously, whereby the volume of the peripheral parts of the arterial tree is reduced, actively and with great force. The blood escapes towards the periphery through the capillaries as pressure is still high in the central arteries. During the diastolic rise in pressure

the smaller peripheral arteries are filled, partly by the compression chamber effect of the central arteries, and partly by the slight active contraction of the larger peripheral arteries. Thus the primary as well as the secondary pulse beat forces the blood towards the periphery.—R.M.

ANDERSON, R. S., STEMLER, F. W., ROGERS, E. B. & MCHUGH, R. F. (1958). **Quantitative studies on circulation of blood in goats.**—*Fed. Proc.* **17**, 4. **3748**

Over a 24-hour period a substantial decrease in the blood pressure, cardiac output and blood volume occurred in anaesthetized goats placed prone on an animal board which were being used as controls for goats wounded by an explosive. A large volume of saliva was lost but the plasma protein concentration remained nearly constant whilst the plasma volume dropped by 10%. Replacement of the saliva lost by subcutaneous injection of saline had little effect on the plasma protein concentration or plasma volume. Saliva is known to have a freezing point depression under these conditions only a little below that of plasma.—A. ACKROYD.

DOUGHERTY, R. W., HABEL, R. E. & BOND, H. E. (1958). **Esophageal innervation and the eructation reflex in sheep.**—*Amer. J. vet. Res.* **19**, 115-128. **3749**

The anatomical structures involved in eructation in sheep are described. Considerable variation was observed in the extent of the parts supplied by, and, in acute experiments on decerebrate sheep, the motor activity produced by stimulation of, any one of the three pairs of motor nerves, the pharyngo-oesophageal, the recurrent laryngeal, and the dorsal branch of the thoracic vagus. Receptors were demonstrated physiologically in a relatively small area around the cardia, which, when properly stimulated, caused reflex excitation or inhibition of eructation. Inhibition was caused by flooding the cardia with water, ingesta or mineral oil in such a manner as to embarrass mechanically the normal cardia clearing mechanism, whilst eructation was stimulated by insufflating various gases into the intact rumen or into a small pouch formed by the walls of the rumen and reticulum adjacent to the cardia. Sectioning of the nerves in the right longitudinal groove at various levels did not inhibit eructation. With the sheep tilted in the dorsum down position, insufflation of the empty rumen and reticulum with water either reduced the efficiency of, or completely inhibited eructation, but eructation could still be stimulated by gas pressure after blocking the eructa-

tion-inhibitory influence of water by local application of butacaine sulphate.

—A. ACKROYD.

KENT, P. W. & PASTERNAK, C. A. (1958). **Bio-synthesis of intestinal mucins. 3. Formation of 'active sulphate' by cell-free extracts of sheep colonic mucosa.**—*Biochem. J.* **69**, 453-458. [Authors' summary modified.] **3750**

Supernatant enzyme fractions from sheep colonic mucosa catalyse the formation of an 'active sulphate' from adenosine triphosphate and sulphate ions.

The 'active sulphate' acts as donor in the formation of phenolic sulphates by liver or mucosal enzymes. No evidence for the sulphation of simple mono- and di-saccharides could be obtained.

Mucosal enzymes catalyse breakdown of adenosine triphosphate to inosine, inosine monophosphate and hypoxanthine.

DYCE, K. M. (1958). **The splanchnic nerves and major abdominal ganglia of the horse.**—*J. Anat., Lond.* **92**, 62-73. **3751**

A detailed account, illustrated by 4 diagrams and 4 plates.—R.M.

MOSS, M. L. (1958). **Extraction of an osteogenic inductor factor from bone.**—*Science* **127**, 755. **3752**

Bone paste samples showing no living osteocytes or osteoblasts were incubated for 24 hours at 37°C. in a Ringer-Tyrode solution, subsequently centrifuged, and the clear brown solution stored at 4°C. Osteogenic activity was demonstrated following operative procedures in rats when pieces of Gelfoam sponge impregnated in the solution were implanted intracerebrally. Control animals showed no osteogenic stimulation or induction following operative procedures alone, or incorporating the use of plasma or Ringer-Tyrode solution. Analysis of the active solution showed a concentration of 0.29 mg./ml. of chondroitin sulphate A, C, or both.

—D. S. PAPWORTH.

TYLER, W. S., JULIAN, L. MCK. & GREGORY, P. W. (1958). **The nature of the process responsible for the short-headed Hereford dwarf as revealed by gross examination of the appendicular skeleton.**—*Amer. J. Anat.* **101**, 477-496. [Abst. from authors' summary.] **3753**

Limb bones from 32 phenotypically normal and 32 short-headed dwarf Herefords were examined with quantitative anatomical techniques. The epiphyseal lines exhibited similar



stages of fusion at similar ages. The limb bones were disproportionate when dwarf and normal Herefords of similar age or body weight were compared. The conclusion that hypoplastic achondroplasia is the dwarfing process was reached by comparing the results of this study with observations made on achondroplastic dwarfs of other species and by determining the affected growth mechanism.

WIDDOWSON, E. M., DICKERSON, J. W. T. & McCANCE, R. A. (1958). **The excretion of urea, ammonia and purine end-products by the newborn animal.**—*Biochem. J.* **69**, 421-424. [Authors' summary modified.] **3754**

The excretion of urea, ammonia, uric acid and allantoin by new-born babies, pigs and pups was studied, and the results compared with values for adults.

The percentage of the total nitrogen excreted as urea was lower in the new-born than in the adult. This has been attributed to the turnover of amino-acids being directed towards anabolism at this age.

The new-born baby, pig and pup excreted a higher proportion of their nitrogen as ammonia than did the adults. The reasons for this are discussed.

New-born pigs and pups excreted more of their purine end-products as uric acid than did adults. In the urine formed by pups in the uterus allantoin contributed a higher percentage of the total nitrogen than did urea. The percentage contributed by allantoin declined rapidly after birth.

MEYER, J. (1958). **Neue Untersuchungen zur Funktion des Präputialbeutels des Schweines. [Function of the preputial sac of the pig.]**—*Zbl. VetMed.* **5**, 475-492. [Summaries in English, French and Spanish. English summary modified.] **3755**

After discussing the anatomy and histology of the preputial sac, and the differences of opinion regarding its function and nomenclature, M. describes his own studies. He concludes that the outer skin, the prepuce and particularly the preputial diverticulum with its keratinized wall and the action of the preputial muscles indicate that the whole constitutes a lubricating pouch.

SOLIMAN, F. A., BADAWI, H. M. & GHANEM, Y. S. (1958). **Influence of temperature and light on thyroid function.**—*Nature, Lond.* **182**, 57. **3756**

At an environmental temp. of 18°C., rats exposed continuously to light for 12 days had lighter thyroid glands and less thyroid and

thyrotrophic hormones in the serum than rats kept in darkness. At 35°C., however, the effects of light and darkness were reversed.—M.G.G.

WEBER, A. F., BELL, J. T., JR. & SELLERS, A. F. (1958). **Studies of the bovine adrenal gland. II. The histological and cytochemical effects of the administration of 1, 1-dichloro-2, 2-bis (p-chlorophenyl) ethane on the adrenal cortices of dairy calves.**—*Amer. J. vet. Res.* **19**, 51-57. **3757**

11 dairy calves were given *per os* 50 mg. per kg. body weight of 1,1-dichloro-2, 2 bis (p-chlorophenyl) ethane, (DDD), for periods of 3 days to 12 weeks to study the effects on the adrenal glands. No symptoms were observed except some distension of the rumen in animals exposed to DDD for the longest periods. Cytological and cytochemical studies of the adrenal cortices revealed a cytopathogenic effect on cells of the inner zona fasciculata and zona reticularis in animals treated for 3 to 15 days. Animals fed DDD for 7½ to 12 weeks showed bands of collagenous connective tissue occupying the mid-fascicular zones. The remaining cortical parenchyma showed no evidence of cytopathogenic effects. Results generally indicated that DDD had only transitory effects on the cells of the adrenal cortex.—D. S. PAPWORTH.

MCDONALD, I. R., GODING, J. R. & WRIGHT, R. D. (1958). **Transplantation of the adrenal gland of the sheep to provide access to its blood supply.**—*Aust. J. exp. Biol. med. Sci.* **36**, 83-95. [Authors' summary modified.] **3758**

A technique is described for transplantation of the left adrenal gland of the sheep to a prepared site in the neck, so as to render its artery and vein accessible in the conscious animal. Histological examination of a transplanted adrenal 34 days after the operation showed no significant difference from normal. Evidence is presented for normal function of such transplants with reference to metabolism of sodium ions and secretion of steroid hormones.

COMLINE, R. S. & SILVER, M. (1958). **Response of the adrenal medulla of the sheep foetus to asphyxia.**—*Nature, Lond.* **181**, 283-284. **3759**

The authors determined the amounts of adrenaline and noradrenaline in venous blood from the left adrenal gland of lambs at between 80 days of pregnancy and term. Nervous control of the gland was abolished by cutting the left splanchnic nerve. The resting level of secretion of these amines was very low, but there was a large increase in secretion, particularly of nor-

adrenaline, when asphyxia was induced by clamping the umbilical cord. The type of secretion which occurred after stimulation of the left splanchnic nerve differed in the predominance of adrenaline over noradrenaline.—R.M.

LOFTFIELD, R. B. & EIGNER, E. A. (1958). **The time required for the synthesis of a ferritin molecule in rat liver.** — *J. biol. Chem.* **231**, 925-943. [Abst. from authors' summary.] **3760**

The incorporation of labelled amino-acid into ferritin begins slowly and gradually increases so that after 6 min. the rate of incorporation is equal to the rate of net synthesis. In ferritin produced 6 or more min. after injection of a labelled amino-acid, every amino-acid residue has been derived from the labelled free intracellular amino-acid.

See also absts. 3541 (effect of oxytetracycline on rumen bacteria); 3559 (enzymic degradation of starch by ruminal holotrichs).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

ANON. (1958). **Synthetic hormones and meat production.**—*Brit. med. J.* March 29th, 762-763. **3762**

There is a possibility of continuous contamination of pasture, soil, and water with synthetic and resistant oestrogens excreted by animals given these preparations, particularly if treatment is by mouth. This accumulation of oestrogens is a hazard to other stock and to man. It is considered that their use in agriculture should be discouraged until more is known of their dangers.—M.G.G.

GOODING, C. D. & LONG, J. L. (1958). **The Kimberley wallaby menace: water poisoning experiments 1955-57.** — *J. Dep. Agric. W. Aust.* **7**, 173-178. **3763**

See also absts. 3470-3471 (staphylococci in milk); 3587 (spread of rinderpest by means of meat); 3811 (Ostertag's textbook for meat inspectors); 3812 (textbook of abattoirs).

## REPRODUCTION AND REPRODUCTIVE DISORDERS

PROBINE, M. C., MCCABE, W. J. & SHANNON, P. (1958). **Selection of bulls for artificial breeding on basis of semen storage characteristics.** — *J. agric. Sci.* **50**, 260-266. [Authors' summary.] **3764**

Analysis of spring mating data in 1955 indicated that the fall in conception rate associated with the use of older semen was a serious problem.

The fall in conception rate in 1955 was more marked in bulls of below average conception rate

MORICONI, A., LORVIK, S. & RENZONI, A. (1958). **Ricerche istochimiche sulla borsa di Fabrizio. [A histochemical study of the bursa of Fabricius.]**—*Atti Soc. ital. Sci. vet., Rimini - Ravenna* 1957. **11**, 679-684. [Summaries in English and French.] **3761**

The histological structure of the bursa of Fabricius is similar to that of lymphoid tissue, consisting of numerous fissures and convoluted furrows which subdivide it into numerous folds covered with a lining of cylindrical epithelium. A histochemical study revealed that the epithelial lining of the folds and the cells (resembling lymphocytes) of the individual lobules secrete a substance rich in lipids and neutral mucopolysaccharides.—T.E.G.R.

Experiments are described on the control by water poisoning of the Kimberley wallaby (*Macropus agilis*) in Western Australia. The wallabies do not drink all the water they need at once, but commonly drink several times over a period of an hour or more. The volume of water consumed at the first of these drinks averaged 36.2 fl. oz. The lethal doses of the poisons used were:—"1080" (sodium fluoro-acetate) 0.2 mg. per lb. body wt. and arsenic pentoxide 7.5 mg. per lb. body wt. As little as 3 g. of "1080" per 100 gal. of water was effective, while arsenic pentoxide was used at the rate of 12 oz. per 100 gal. of water. Water poisoning is discussed in relation to exclusion of stock, protection of native fauna and timing of the poisoning season. Details of the first year's operation are given.—R. I. SOMMERVILLE.

than in those with above average conception rate.

Results for groups in two successive years indicate that this decline is highly repeatable.

Bulls which have 'good keeping quality' semen can be selected on the records of a previous season. Where there is no previous record, it has been shown that an individual can be classified as a 'good keeper' or a 'poor keeper' by measuring the fructolysis index of the semen on the day after collection. If the fructolysis



index is above some minimum figure (1.05 mg. fructose per hr./10<sup>9</sup> sperm has been adopted in this case for second-day semen), the bull can be used for delayed inseminations with good prospects of success.

The best method of classification would appear to be: (i) initial classification by fructolysis index; (ii) subsequent rejection of bulls of low fertility in this group after fertility records are available.

CROMBACH, J. J. M. L. (1958). De invloed van voorbereiding vóór het dekken op de sperma-productie en de bevruchtingsresultaten van K. I. stieren. [**Influence of preparation before service on semen production and conception rate of artificial insemination bulls.**]—*Tijdschr. Diergeneesk.* 83, 137-144. [In Dutch. Summaries in English, French and German.] 3765

Bulls were prepared for semen collection by being stood behind a dummy cow for 5 min. They were then allowed to mount the dummy twice, no artificial vagina being provided on the first occasion. This treatment led to improved quality of first and second ejaculates and doubled the number of motile spermatozoa. Continued use of the method did not diminish its effectiveness.—R.M.

HESS, E. A., LUDWICK, T. M., RICKARD, H. E. & ELY, F. (1958). **Some of the effects of heterospermic processing on semen quality and bovine fertility.**—*Fertil. & Steril.* 9, 238-242. 3766

51 different mixtures of semen from 47 bulls were compared. Mixed ejaculates had a higher motility and yielded a higher conception rate than the individual ejaculates. This confirmed the results of Russian work on heterospermic insemination.—R.M.

DOTT, H. M. & WALTON, A. (1958). **Motility and survival of spermatozoa in mixed semen from different bulls.**—*J. agric. Sci.* 50, 267-272. [Authors' summary modified.] 3767

Semen samples from 5 Dexter bulls were mixed and the effects of mixture on the live/dead ratio, the percentage of abnormal cells and on motility and survival of motility as measured by impedance change frequency were studied. Altogether 56 samples and mixtures were examined. No effect of mixture on live/dead ratio nor on percentage of abnormal spermatozoa was found, but mixtures of semen had a motility which was slightly nearer the value of the less active component of the mixture than that of the means of both components. No explanation for this effect is offered.

BIALY, G. & SMITH, V. R. (1958). **Influence of seminal vesicular fluid on morphology of bull spermatozoa.**—*J. Dairy Sci.* 41, 422-428. [Authors' summary modified.] 3768

The distribution of spermatozoa with protoplasmic droplets in the various parts of the epididymis of slaughtered bulls was studied, using 11 paired and 9 single specimens. The mean percentage of spermatozoa with droplets in the caput, corpus, and cauda was 62, 41, and 84, respectively. The percentage of spermatozoa with droplets from the right and left sides of the same bull varied less than among bulls. 6% of the spermatozoa from the ampullae had droplets.

When samples of fluid from the seminal vesicles were added to epididymal spermatozoa, changes occurred in the percentage of spermatozoa with protoplasmic droplets. In the corpus and cauda epididymidis the percentages of spermatozoa with distal droplets, and in the caput those with proximal droplets decreased significantly while in the caput those with distal droplets increased. The decrease in the percentage of total spermatozoa with droplets after the addition of the fluid was statistically significant.

KINAST, F. (1958). Der Einfluss von Vorsekret und Sekret der Samenblasen auf Bullensperma. [**Action of the preliminary ejaculate and the secretion of the seminal vesicles on metabolism of bull spermatozoa.**]—*Inaug. Diss., Munich*, pp. 31. 3769

Fresh preliminary ("pre-sperm") ejaculate temporarily increased the oxygen consumption of bull spermatozoa, whether they were obtained from ejaculate or from the epididymis. Preliminary ejaculate which had been stored damaged spermatozoa. Fresh seminal vesicle secretion caused intense and long-lasting increase in oxygen consumption of spermatozoa.—R.M.

WILLETT, E. L. & OHMS, J. I. (1958). **Inactivation of spermatozoa by lactate and reactivation with alkali.**—*J. Dairy Sci.* 41, 275-280. [Authors' summary modified.] 3770

In two experiments, comparisons were made on the inactivation and reactivation by alkalization of spermatozoa in two basic diluents: (a) "YC" (one part egg yolk and one part of a 2.9% solution of sodium citrate dihydrate), and (b) "YGL" (one part yolk, four parts of a 5% soln. of glucose, and one part of different combinations of a 1.25% soln. of lactic acid and a 0.6% soln. of sodium hydroxide to vary the pH level). Survival of spermatozoa in the lactate diluents at 5°C. for 7 days was not enhanced by the presence of sulphanilamide. Rather was complete

inactivation of spermatozoa observed after storage in YGL at pH 6.4, but not in YC at the same pH. Reactivation of spermatozoa after storage in the lactate medium can be accomplished by increasing pH to levels above 7. These spermatozoa are then capable of maintaining motility for at least an hour at room temp. or for 24 hours at 5°C. despite high pH. More work is needed to determine the value of inactivation with lactate in preservation of spermatozoa.

AAMDAL, J., HOGSET, I. & FILSETH, O. (1958). **Extirpation of the preputial diverticulum of boars used in artificial insemination.**—*J. Amer. vet. med. Ass.* **132**, 522-524. [Authors' summary modified.] **3771**

Surgical extirpation of the preputial diverticulum in boars used in artificial insemination is described. As a result, the number of bacteria in semen collected with the artificial vagina was considerably reduced. Semen collection is less disagreeable because the intense odour from the preputial fluid is absent. The typical odour in the boar stalls was also greatly reduced.

CHANG, M. C. & THORNSTEINSSON, T. (1958). **Effects of urine on motility and fertilizing capacity of rabbit spermatozoa.**—*Fertil. & Steril.* **9**, 231-237. **3772**

As the proportion of urine contamination of semen increased, the motility of spermatozoa decreased and the concentration of reducing substances increased, but the fertilizing capacity of spermatozoa was not affected, even when they were suspended in 50% urine.—R.M.

WHITE, I. G. (1958). **Biochemical aspects of mammalian semen.**—*Anim. Breed. Abstr.* **26**, 109-123. **3773**

A review of literature published during the past 4 years on the chemical composition of seminal plasma and spermatozoa of animals.

—R.M.

DE MUELENAERE, H. J. H. & QUICKE, G. V. (1958). **Studies on the biochemistry of cock semen. I. Seminal sugars.**—*S. Afr. J. agric. Sci.* **1**, 67-74. [In English. Summaries in French and Afrikaans. Authors' abst. modified.] **3774**

A study of the sugars present in fowl semen revealed that glucose was the main sugar, as demonstrated by paper chromatography and the formation from the semen of potassium gluconate and glucobenzimidazole. The average value for "total reducing sugars" was 35 mg./100 ml. whole semen of which 9.4% was fructose or a similar ketose. Of the "total reducing sugars"

present in seminal plasma 81.6% was glucose and 7.9% consisted of non-fermentable substances.

QURESHI, S. H. (1958). **Effect of addition of sex hormones to chicken semen with and without antibiotics on the livability and fertilizing capacity of spermatozoa.**—*Pakist. J. sci. Res.* **10**, 13-19. [Author's summary modified.] **3775**

Addition to fowl semen of either diethylstilboestrol or testosterone propionate together with streptomycin improved the survival and fertilizing capacity of the spermatozoa during 8 hours' storage at 10° to 12°C.

FALLON, G. R. (1958). **Some aspects of oestrus in cattle, with reference to fertility on artificial insemination. I. The pattern of oestrous cycles.**—*Qd J. agric. Sci.* **15**, 25-33. [Author's summary modified.] **3776**

Aspects of the incidence of oestrus, together with fertility data, have been investigated in Jersey cows in Queensland.

For 383 cows, the mean interval between parturition and first oestrus was  $40.45 \pm 22.70$  days. The modal interval occurred at 26-30 days, and 79% of the cows exhibited first heat 11-55 days after calving. Fertility data indicated that fertility at first heat is a function of the post-partum interval rather than of any characteristic of first heat *per se*.

Of 441 non-service oestrous cycles, 18.4% were less than 18 days in duration. Approximately 94% of the short cycles occurred between first and second heats. Short cycles were also recorded in the case of 10.9% of 567 service-return cycles, but were not so closely associated with first heat. Fertility rates for cows artificially inseminated after short cycles were similar for first and repeat inseminations and were of the order of 57%.

Non-service cycles exceeded 25 days in 11.4% of cases, whereas 33.3% of service-return cycles were of long duration. First insemination fertility (79%) after such long cycles was markedly higher than that of repeat inseminations performed after long service-return cycles (55%).

Attention is drawn to the importance of the high incidence of short oestrous cycles in the overall pattern of ovarian dysfunction in the area concerned.

AVERILL, R. L. W. (1958). **The production of living sheep eggs.**—*J. agric. Sci.* **50**, 17-33. **3777**

Superovulation was induced in over 200



ewes of 2 different breeds by treatment with pregnant mares' serum, with or without progesterone. The dioestrous cycle was shortened by this treatment. An average of 57% of eggs shed by each ewe were recovered by laparotomy between 49 and 72 hours after mating, and between 75 and 86% of the eggs recovered had been fertilized. The proportion of abnormal eggs (4%) recovered from treated ewes did not exceed that of normal ewes. 80% of normal cleaved eggs continued to develop to full term when transferred to the uterus of 16 recipient ewes. There was no evidence to suggest that pregnancy was less likely to be maintained up to the 21st day in ewes hormonally induced to breed in anoestrus, as opposed to ewes which were superovulated in the breeding season.—R.M.

MICHAEL, R. P. (1958). **Sexual behaviour and the vaginal cycle in the cat.**—*Nature, Lond.* **181**, 567-568. **3778**

Observations on 15 female cats kept under lab. conditions revealed a correlation between sexual behaviour and the microscopic appearance of vaginal smears at every stage of the oestrous cycle.—R.M.

ROSSDALE, P. D. & MAHAFFEY, L. W. (1958).

**Parturition in the Thoroughbred mare with particular reference to blood deprivation in the new-born.**—*Vet. Rec.* **70**, 142-152. **3779**

The authors observed 61 foalings in Thoroughbred studs and found that the groom usually severed the umbilical cord immediately after parturition. This act deprived the foal of 1-1½ litres of maternal blood, while in the absence of human interference only about 200 ml. was lost. A relationship between early severance and a convulsive syndrome of foals has already been noticed [*V.B.* **28**, 2970]. The authors recommended that in a normal parturition the umbilical cord should be allowed to sever spontaneously without human interference.—R.M.

WRIGHT, J. G. (1958). **Bovine dystocia.**—*Vet. Rec.* **70**, 347-356. **3780**

The incidence and causes of abnormal labour in dairy cattle in a group of farms near Liverpool from 1950-57 are reported and the indications for caesarian section in a series of 200 cases are reviewed. Veterinary assistance was required in 4.5% of the 2097 calvings, the incidence being significantly higher in the 2 Friesian than in the 2 Ayrshire herds. The most frequent cause was oversize of a normally presented foetus (55%), with uterine inertia next (17%), whilst malposition comprised 16%. All except 3 of the animals were delivered *per vaginam*.—A. ACKROYD.

LANZ, E. (1958). Zur Kaiserschnitt-Operation beim Rind. [**Caesarian section in cows.**]—*Schweiz. Arch. Tierheilk.* **100**, 329-337. [Summaries in English, French and Italian.] **3781**

During 3 years 120 caesarian sections were performed on cows at Berne University and only 2 cows died. 97 of the calves lived. 65 cows were served again and 50 conceived. 3 cows each had 2 operations.—R.M.

DE BOIS, C. H. W. (1958). Sectio caesarea bij het schaap. [**Caesarian section in sheep.**]—*Tijdschr. Diergeneesk.* **83**, 248-263. [In Dutch. Summaries in English and German.] **3782**

Indications for caesarian section on 113 ewes were as follows: vaginal prolapse before parturition (26 ewes) or during parturition (49 ewes); incomplete dilatation of the cervix (35 ewes); uterine torsion (3 ewes). 93 of the ewes survived the operation and of 242 lambs delivered 101 survived.—R.M.

LUCAS, J. J., BRUNSTAD, G. E. & FOWLER, S. H. (1958). **The relationship of altered thyroid activity to various reproductive phenomena in gilts.**—*J. Endocrin.* **17**, 54-62. [Authors' summary modified.] **3783**

Three groups of fifteen gilts were used to test the effects of altered thyroid activity on ovulation, fertilization and embryonic mortality. Two groups received 0.15% thiouracil and 0.0123% thyroprotein, respectively, in a basal ration, and the third served as controls. All gilts were assigned to treatment sets at first oestrus and were mated to fertile boars at second oestrus. One-third were slaughtered 12-24 hours after the end of second oestrus, one-third 25 days after mating and the remainder allowed to farrow.

There were no significant differences between groups for: ovulation rate, fertilization rate, embryonic mortality during the first 25 days of gestation, number of normal embryos at 25 days after mating, or number of piglets born alive. A significant increase in the duration of gestation was found for thiouracil-treated females. Piglets born to thyroprotein-supplemented dams were heavier at birth than those born to thiouracil-treated dams. Thiouracil produced a highly significant embryonic mortality from the 25th day of pregnancy until farrowing. Thyroprotein treatment tended to lower embryonic mortality during the same period.

VERVLOESEM, A. (1958). Puerperale sepsis en toxaemie bij zeugen. [**Puerperal sepsis and toxæmia in sows.**]—*Vlaams diergeneesk. Tijdschr.* **27**, 42-46. [In Flemish. Summaries in English, French and German.] **3784**

Material for bacteriological examination was collected by laparotomy 1 or 2 days after parturition from the uterus of 16 sows with puerperal sepsis or toxæmia, accompanied by agalactia and mastitis. Further material was obtained when some of the sows were slaughtered a few days later. *E. coli* was isolated from the uterus and udder of 13 sows. It was often associated with streptococci, staphylococci and anthracoid organisms; a klebsiella was isolated from one sow.—R.M.

LAMOND, D. R. & CLARINGBOLD, P. J. (1958). **Joint action of gonadotrophic substances.**—*J. Endocrin.* **16**, 298-303. 3785

The combined action of certain pairs of the following gonadotrophins on weight of the uterus in immature mice was investigated:—human pregnancy gonadotrophin; human postmenopausal gonadotrophin; pregnant mares' serum; follicle stimulating hormone from purified pituitary gland of pig; luteinizing hormone from purified pituitary of sheep; purified sheep pituitary gland. In every case the combined action was similar. This suggested that the preparations contained a common component which stimulated early production by the ovary of a substance which promoted uterine growth.

—R.M.

SANGER, V. L., ENGLE, P. H. & BELL, D. S. (1958). **Evidence of estrogenic stimulation in anoestrous ewes pastured on Ladino clover and birdsfoot trefoil, as revealed by vaginal smears.**—*Amer. J. vet. Res.* **19**, 288-294. 3786

Vaginal smears, stained by the Papanicolaou method, from apparently normal ewes on dry feed had few cells during anoestrus, prooestrus and oestrus; the cells consisted mainly of basophilic and squamous (eosinophilic) cells. During metoestrus and dioestrus the mucus was thick and cheesy and there were large numbers of cells, mostly squamous cornified epithelial cells.

Smears from anoestrous ewes fed Ladino clover and bird's-foot trefoil, and from anoestrous ewes injected with stilboestrol, were similar to the smears of normal ewes during metoestrus and dioestrus. It was concluded that there was an oestrogen in Ladino clover and bird's-foot trefoil. [See also *V.B.* **28**, 1577.]

—R.M.

CROSS, B. A. (1958). **The motility and reactivity of the oestrogenized rabbit uterus *in vivo*; with comparative observations on milk ejection.**—*J. Endocrin.* **16**, 237-260. 3787

Spontaneous motility of the intact uterus of spayed oestrogen-treated rabbits under pento-

barbitone anaesthesia was recorded. The threshold dose of oxytocin for activating the uterus was the same as that for the lactating mammary gland (1-5 milliunits). Adrenaline or noradrenaline in doses of 1-5  $\mu$ g. produced diphasic uterine responses, initial contractions being followed by inhibition of spontaneous motility. The same responses could also be obtained by electrical stimulation of the hypothalamus. Dilatation of the vagina gave rise to a uterine response similar to that resulting from adrenaline; it was abolished by spinal anaesthesia, but not by mid-thoracic section of the spinal cord or decerebration.—R.M.

DAWSON, F. L. M. (1958). **Observations on the corpora albicantia in the ovaries of normal and infertile dairy cows.**—*J. agric. Sci.* **50**, 322-330. [Author's summary modified.] 3788

The ovaries from 251 cows with known histories were dissected, and this work was linked with clinical and histopathological studies. In almost 20% of the cows, resorption of corpora albicantia appeared to have taken place, beginning usually after the fourth pregnancy. In 10% of cows more corpora albicantia were found than corresponded with the normal pregnancies. Most of such cases appeared to be associated with unrecognized 'temporary pregnancies', but normal pregnancy associated with two corpora lutea, as in the camel, may occur, though rarely. A scheme with correction factors, for allocating random samples to age categories, has been prepared. From 110 cows (44%), miniature as well as full-sized corpora albicantia were recovered. Evidence from their histories is brought forward that the miniature corpora correspond to 'temporary pregnancies' of perhaps 2-5 months' duration. This is cross-checked and confirmed, both from the histories of 112 cows yielding no miniature corpora, and also by correlation with the histopathological findings from the genital organs.

AAMDAL, J. & NES, N. (1958). **Persisterende frenulum praeputii som årsak til bedekningsimpotens hos râne. Foreløpig meddelelse. [Persistent frenulum of the prepuce as a cause of impotence in boars.]**—*Nord. VetMed.* **10**, 444-446. [In Norwegian. Summaries in English and German. English summary modified.] 3789

Persistent frenulum of the prepuce caused mating difficulties in 5 Norwegian Landrace boars. The condition was probably inherited. The affected pigs had a common ancestor and the method of inheritance is being investigated.



JEFFERIES, W. MCK., WEIR, W. C., WEIR, D. R. & PROUTY, R. L. (1958). The use of cortisone and related steroids in infertility.—*Fertil. & Steril.* 9, 145-166. 3790

It was stated that women with ovarian dysfunction manifested by anovulation or infrequent ovulation and infertility may respond dramatically to the proper dosage of cortisone or hydrocortisone, with resumption of normal ovulatory cycles and pregnancy.—R.M.

CARR, J. G. (1958). A malformation of the duodenal loop occurring in fowls.—*Brit. vet. J.* 114, 234-236. [Author's summary modified.] 3791

A malposition of the duodenal loop in chickens, considered to be genetic in origin, is described. Affected birds made poor growth.

SLEE, J. (1957). The morphology and development of 'ragged'—a mutant affecting the skin

See also absta. 3501-3511 (brucellosis); 3514 (isolation of *L. pomona* from a bovine foetus); 3522-3524 (vibriosis); 3810 (book, livestock improvement in relation to heredity and environment).

## ZOOTECHNY

BODENWEISER, L. E. & PETERSON, K. J. (1958). Successful method of destroying large numbers of turkeys under field conditions. — *J. Amer. vet. med. Ass.* 132, 238-240. 3794

The following method was used to destroy a flock of 2627 adult turkeys infected with psittacosis that failed to respond to prolonged treatment with antibiotics.

A trench, about 100 ft. long, 18 ft. wide, 8 ft. deep, and sloping at both ends, is excavated by bulldozer. One end is closed by a fence. Boards are placed over the trench, to provide support for a roof of polyethylene sheeting and for a curtain of tarpaulin at each end. Up to 1,500 birds are driven into the trench, which is then closed by a second fence. Heavy tarpaulins are then suspended from the boards, and a polyethylene sheet, about 6 ft. wider and 20 ft. longer than the trench itself, is stretched over the boards. Soil is used to anchor the sheet and tarpaulins and to seal the trench. Carbon monoxide is applied for about 20 min. by means of hoses connected to the exhaust pipes of 3 motor-cars. Euthanasia is rapid and there is no excitement or struggling. More than one trench should be used for very large numbers of birds, as turkeys will resist being driven into a trench containing dead birds.—M.G.G.

ANON. (1958). Désinfection des wagons servant aux transports des animaux. [Disinfection of railway waggons used for transport of live-stock.]—*Bull. Off. int. Epiz.* 49, 304. 3795

and hair of the house mouse. I. Adult morphology. II. Genetics, embryology and gross juvenile morphology.—*J. Genet.* 55, 100-121 & 570-584. 3792

A detailed study of the inherited skin disorder first described by Carter & Phillips [*J. Hered.* 45, 151 (1954)], and characterized by retardation of hair growth, oedema at birth, and high mortality.—R.M.

SHUTE, E. (1958). Vitamin E in the prophylaxis of congenital abnormalities.—*Fertil. & Steril.* 9, 256-265. 3793

S. claimed that treatment of the male with alpha-tocopherol for 2 weeks or more before coitus, reduced the incidence of congenital abnormalities in the offspring. This treatment was carried out in 19 of 110 families in which grossly abnormal infants had been born. In 17 of the 19 no abnormal offspring were produced by the pregnancy following treatment.—R.M.

For the disinfection of railway waggons the International Union of Railways recommends a 1% soln. of commercial formol at the rate of 30-40 litres per waggon. The floor and walls are to be pressure-sprayed by means of a multiple jet before removal of the dung and litter. After removal of the dung and litter the floor and walls are to be swept and, if necessary, scraped and then thoroughly sprayed a second time to remove all traces of excreta. It is also recommended to use the formol soln. at a temperature of 50°C. as that increases its disinfectant properties and reduces the time for the smell of the formol to disappear (in cold soln. it lasts 12-24 hours).—T.E.G.R.

WRIGHT, M. L. (1958). Hatchery sanitation.—*Canad. J. comp. Med.* 22, 62-66. 3796

In the author's opinion sanitation is an all-embracing term covering precautions taken to ensure healthful conditions. The hatcheryman's programme of sanitation should effectively keep the microbial population below an infectious level. The programme should include blood testing and immunization of breeding stock. Fumigation with formaldehyde of the incubator is essential. The effectiveness of the fumigation method should be tested by fluff sampling. No fumigation programme should be used to replace cleanliness but rather to supplement it.

—P. D. MCKERCHER.

MØLLER, F. & NEIMANN-SØRENSEN, A. (1957).

**Cytological sex determination in cattle on basis of chorionic cells.**—*Nord. VetMed.* 9, 675-686. [In English. Danish and German summaries, English summary modified.] 3797

The authors examined 65 preparations from bovine amniotic or allantoic fluid and 28 whole mounts of the embryonic membranes. In all cases cresyl violet (1%) was used for staining. All microscopic sex diagnoses were made without knowledge of the sex. On the 65 fluid samples 7 diagnoses were wrong, whereas the sex of the remaining 58 (23 males and 35 females) was correctly determined microscopically. The sex diagnoses on all 28 (15 males and 13 females) chorionic membranes were correct. The sex chromatin was found in female nuclei with an incidence of 52-68%, while it occurred in only 8-20% of the male cells. The appearance and location of the sex chromatin is described and shown in photomicrographs.

SCOTT, I. W. (1957). **Herd wastage, calf wastage and fertility survey.** pp. 33. Australia: N. S. W. Dep. Agric. Div. Dairying. 3rd Edit. 3798

From 1949 to 1954, herd wastage was studied in an average of 210 herds in New South Wales. Average wastage (as percentage of total cows) was:—from low production 2.60, from diseases 2.06, sold for dairying 0.48, old age 1.09, accident and injury 0.28, other reasons 3.19, giving a total of 9.70%. Herds in the survey were recorded herds and may have a lower wastage than in all herds in N.S.W.

Disposal of female calves (as percentage of total calves born) was for 1949-53:—26.69 kept for dairying, 6.08 sold for slaughter, 2.11 killed as surplus, 1.54 sold for dairying, 6.71 others. For males, 2.87 kept for breeding and 0.53 sold for breeding. 1.06% of total birth were twins.

Fertility records from the same herds (28,000 cows) for 1950-54 showed that 3.27% were infertile. Of fertile cows, 66.16% were fertile to first mating, 20.45 to second, and 7.59 to third. 14% of cows milked less than 6 months of the year and the average lactation of recorded cows was 8 months. Much of this is due to too early mating: 6.6% of cows were fertile to a mating within 28 days of calving.

—J. S. F. BARKER.

THROSSELL, G. L. (1957). **Beef cattle studies, "Narra Tarra", Geraldton, W. A.**—*J. Agric. W. Aust.* 6, 461-467. 3799

These were part of a project in the southern States of Australia to obtain data on the growth

performance of cattle under existing systems of management. The project commenced in 1951 with a group of Aberdeen-Angus steers, and one of older Beef Shorthorn steers. All groups in subsequent years were Aberdeen-Angus. Graphs showing average growth curves and average daily growth rate over the 4 years of the experiment, and other data, are presented. The growth curves for each year are very uniform. During autumn the cattle maintain their weights or lose very slightly until the rains, when without supplementary feeding they lose rapidly for 2 months. As soon as green feed becomes available they gain rapidly, reaching a maximum daily growth of 2.3 lb. per head in August and September. As pastures decline and temperatures increase in summer the growth rate slows down, but continues till autumn.—A. G. CULEY.

ARBuckle, J. (1958). **More beef from Brahman cross.**—*Qd agric. J.* 84, 427-431. [Author's summary modified.] 3800

In a 2½ year trial in Central Queensland, Brahman zebu cross-bred steers grew at an average rate of 13.5 oz. a day, as against 10.8 oz. for Herefords, and during that time gained 795 lb. compared with 636 lb. for the Herefords. The dressed carcasses of the cross-breds were 92 lb. heavier and of better quality.

WOOD-GUSH, D. G. M. (1958). **The effect of experience on the mating behaviour of the domestic cock.**—*Animal Behaviour* 6, 68-71. [Author's summary modified.] 3801

Four Brown Leghorn males were reared in isolation until the age of 6½ months, when their behaviour with females was compared to that of ten males reared in the usual way. No clear-cut difference was found between the behaviour of the two groups towards females. The results of exposing young males to a dummy pullet and data from other sources suggest that social facilitation may play an important role in the adjustment of some cockerels. The present methods of rearing cockerels under practical conditions are questioned and discussed.

MCBRIDE, G. (1958). **Relationship between aggressiveness and egg production in the domestic hen.**—*Nature, Lond.* 181, 858. 3802

A relationship between aggressiveness and egg production was observed in pullets on deep litter but not in those in battery cages. It is considered that low priority at the feeding troughs, nests and roosting places partly accounts for the lower egg production of the less aggressive birds.—M.G.G.



## MISCELLANEOUS

KRAMER, W. (1958). Frontale leucotomie bij de hond. (Een voorlopige mededeling.) [**Frontal leucotomy in dogs.**] — *Tijdschr. Diergeneesk.* **83**, 589-599. [In Dutch. Summaries in English, French and German.] **3803**

Frontal leucotomy was performed on two dogs. From the results K. suggested that the operation might be of value for dangerously aggressive dogs which would otherwise have to be destroyed.—R.M.

## REPORTS

ANON. GREAT BRITAIN. (1958). **Agricultural and Food Statistics. Interdepartmental Committee on Social and Economic Research.** pp. 71. Guides to Official Sources: No. 4. London: H. M. Stat. Off. 4s. 6d. **3804**

This report explains how official statistics relating to agriculture and food in the United Kingdom may be located: it does not provide statistics for any particular subject. Information of veterinary interest is contained in sections on numbers of livestock and farms, and livestock output. There is no mention of any sources of information on diseases of animals.—R.M.

THE GAMBIA. (1957). **Report of the Department of Veterinary Services for the period 1954-1955.** [WALSHE, S. L. H.] pp. 16. Bathurst: Government Printer. 1s. 6d. **3805**

Outbreaks of disease reported in 1954 were:—RINDERPEST 10; BLACKLEG 28; ANTHRAX 2; and HAEMORRHAGIC SEPTICAEMIA 48.

In 1954 inoculations were:—rinderpest lapinized virus 41,606 and formalized spleen virus 3,496; blackleg 5,470; anthrax 5,490.

In 1955 there were six outbreaks of RINDERPEST. A few animals inoculated with lapinized virus reacted but recovered.

Animals inoculated were:—42,777 with rinderpest lapinized virus and 1,313 with formalized spleen vaccine; bovine contagious pleuropneumonia vaccine 4,934; blackleg 3,836; anthrax 726 and haemorrhagic septicaemia 30,107.

TUBERCULOSIS in cattle had not been diagnosed by the Veterinary Laboratory since a Veterinary Service has been in existence. Tuberculin tests carried out during the period of the present report were negative. There were some non-specific reactions to tuberculin. Mornet's figures in his "La tuberculose animale en Afrique Occidentale française" are quoted. These show that of the cattle (up to 25,000) slaughtered annually at Dakar very few are infected, usually 0.1% to 0.3%, but only 0.008% in 1951.

An investigation in progress has already shown that BRUCELLOSIS is prevalent in cattle.

TRYPANOSOMIASIS occurs in horses; and treatment is with "Antrycide" and "Trimon".

MANGE and FOOT ROT occur in sheep and goats.

Three outbreaks of RABIES among dogs were confirmed.

NEWCASTLE DISEASE is not very virulent to local fowls but imported birds suffer 100% mortality. FOWL POX and TB. also occur in the Colony area.

All Veterinary Stations treat sick and injured animals, most of these being pack donkeys worked in the ground-nut season.

—J. A. GRIFFITHS.

NETHERLANDS. (1958). De Provinciale Gezondheidsdienst voor dieren in Zuid-Holland. [**Provincial health service for animals in South Holland. 11th Annual Report 1956/57.**] pp. 61. Gouda: Gezondheidsdienst voor Dieren. [In Dutch.] **3806**

Eradication of bovine TUBERCULOSIS was almost complete in May 1957: during the year 590 tuberculous cattle (0.23% of all cattle) were detected in 298 herds (2.39% of the total). Dairy herds were declared to be free from bovine BRUCELLOSIS when 3 consecutive ring tests on bulk milk samples were negative: 84% of all herds were tested in this way and 3 negative tests were obtained in 41%. Control of warble flies improved, and cattle on 68% of farms examined were free from WARBLER, compared with 21% in 1948. Trials of DNC as a molluscicide in the control of LIVER FLUKE were continued, but they had not yielded positive results.

—R.M.

ANON. NETHERLANDS. (1958). Verslag over de landbouw in Nederland over 1956. [**Report on agriculture in the Netherlands in 1956.**] pp. liii + 465. 'S-Gravenhage: Ministerie van Landbouw Visserij en Voedselvoorziening. [In Dutch. Summary in English.] **3807**

A section of this report deals with livestock (pp. 101-149). The livestock population at December, 1956 was 2.8 million cattle, 2.5 million pigs, 209,000 horses, 433,000 sheep, 24.6 million fowls, 600,000 ducks, and about 75,000 turkeys. The number of goats owned by members of breed societies fell from 10,000 to about

9,000. Artificial insemination was performed in 962,000 cattle (44.7% of all female cattle over a year old) and 91.4% became pregnant, 61% after the first insemination. Figures for BOVINE TUBERCULOSIS show that at the completion of the 5-year eradication campaign on 1st May, 1956, 97.4% of herds were free from TB, and 14,700 of 2.6 million cattle reacted to the tuberculin test. Ring tests for BRUCELLOSIS were performed on herd milk samples quarterly, and conditions for the establishment of brucellosis-free

herds were prescribed. There were 47 outbreaks of FOOT AND MOUTH DISEASE, mainly in pigs. The incidence of SWINE FEVER decreased slightly (1,084 outbreaks in 1956; 1,241 in 1955). There were only 109 outbreaks of NEWCASTLE DISEASE (443 in 1955). A vaccine against INFECTIOUS BRONCHITIS which could be administered in drinking water was made available. The existence of a "rough" variant of *S. pullorum* was confirmed and a new antigen was prepared to detect this variant.—R.M.

## BOOK REVIEWS

RAETTIG, H. (1958). Bakteriophagie 1917 bis 1956. Teil I. Einführung, Sachregister, Stichwortverzeichnis. Teil II. Autorenregister. [Bacteriophage: 1917 to 1956. I. Introduction, subject index and alphabetical index. II. Author index.] pp. xix+215 and 344. Stuttgart: Gustav Fischer. DM 44. **3808**

This book is not only a guide to the literature on bacteriophage but also a fresh approach to the problem of documentation of scientific literature. In his 27-page Introduction, the author discusses the problem of how to collate scientific literature and relates the growing volume of publications to previous attempts to deal with it. In his opinion the large text-book such as that of Kolle, Kraus & Uhlenhuth on pathogenic micro-organisms is now outmoded, and the time has come for series of bibliographies each dealing with one restricted subject. The author's introduction will be a valuable guide to those attempting a similar task for subjects other than bacteriophage.

Raettig has collected 5,655 references to bacteriophage (BA) published since its discovery in 1917 and they are listed in Part II of this work, in alphabetical order under authors' names. Each entry is numbered, and the numbers are used in a comprehensive subject index, which forms the bulk of Part I. There are 83 main headings in this subject index and each has numerous subheadings; a separate alphabetical index helps one to locate the heading required.

Although the author appears to have achieved completeness with regard to the bacteriological and medical literature, there are omissions, some of them important, in references of veterinary importance dealing with the occurrence of BA in animals, BA therapy in diseases of animals and the use of BA in typing organisms pathogenic for animals. Examples of omissions found for the period 1943-1956 only are:—Dale *et al.* (1944) on *S. cholerae suis* BA in swine

faeces; Spalatin (1943) on BA in fowls; Gallo & Vogelsang (1946) on BA in faeces of animals; Macdonald (1946) on phage typing of *Staph. aureus* in milk; Vladimirov *et al.* (1944) and Sherstoboev & Gaklin (1946) on BA therapy in diseases of horses; Hammer (1951) on BA of *Erysip. rhusiopathiae*; Beganović (1951) and Beganović & Topolnik (1951) on BA of *S. pullorum*; Severa (1955) and Král (1955) on BA of *S. cholerae-suis*; Kvesitadze (1943, 1945 & 1956) and Nedashkovskii (1945) on BA therapy in paratyphoid and colibacillosis of calves.

Omissions of one aspect or another from a subject with so many ramifications into all branches of science are perhaps unavoidable, and they form a very small percentage of the literature covered. The author has assembled the literature and compiled this book in four years, a great achievement for one man. The book will be indispensable for those working with bacteriophage and as an inspiration and example to those who would do the same with other subjects.—R.M.

HUTT, F. B. [Professor of Animal Genetics, New York State College of Agriculture.] (1958). **Genetic resistance to disease in domestic animals.** pp. xii+198. Ithaca, New York: Comstock Publishing Associates. [A division of Cornell University Press.] **3809**

This very interesting little book has been written by an enthusiast who is also something of an iconoclast. The underlying thesis is that in the control of disease in livestock insufficient use is being made of breeding techniques designed to develop strains of animals resistant to various diseases and that genetics has a great contribution to make to disease control.

In his preface the author, a geneticist who has worked for many years with poultry, states that the book will be condemned by veterinarians for its "rank heresy". There is indeed much in it which will arouse opposition but this seems



to the reviewer to be the result of overstatement and exaggeration of an otherwise sound thesis. One gets an impression that some of the exaggerations have been deliberate and designed to stimulate reaction. Perhaps a more serious criticism is lack of critical evaluation in selecting examples to support the theory and at the same time omission of examples which do not support it.

There are nine chapters. The first is a general introduction in which the success achieved by plant breeders in producing plants resistant to disease and to insect attack is stressed. Then a chapter headed "Innate disease" dealing with well known lethal and semilethal hereditary defects and with the methods to be used in eliminating them. The third deals with resistance to environmental conditions such as heat, inadequate diet and so on. Included in the chapter is a section on mycotic infections in cattle in which it is stated "that resistance and susceptibility to such infection are determined by heredity". This pronouncement is based on an observation in Sweden that both of a pair of identical twin calves developed a mycotic infection of the intestinal mucous membrane at about the same time. One can think of several reasons why this pair of twins might have contracted this unusual infection while other cattle in the herd did not, but for Hutt there is only one explanation namely "It is clear that this pair of identical twins differed from other cattle in being genetically highly susceptible to the molds in their hay". The next three chapters deal with examples of resistance to disease in small animals, large animals and birds (fowls mainly) respectively. Then there is a chapter on examples of aberrant metabolism such as purine metabolism in the Dalmatian dog, hereditary photosensitization in some strains of Southdown sheep and the superiority of the White Leghorn over all other breeds of fowl in ability to thrive on low levels of certain vitamins, and to resist various diseases etc. The last two chapters discuss the mechanics of resistance to disease and ways in which resistance can be utilized in practice. In the last chapter is a very sweeping condemnation of the slaughter policy adopted in the U.K. in dealing with Newcastle disease. This is based on the relative failure of the policy in Lancashire but nothing is said of the fact that large areas of England and Wales and the whole of Scotland have enjoyed virtual freedom from this disease for many years.

It is a pity that Hutt has rather spoiled his case by bias. Many examples could be quoted but space will permit only a few. For example much is made of the fact that natural selection

over many years has produced zebu breeds of cattle in India which are highly resistant to the effects of high environmental temperature but we are not told why natural selection in India has not produced cattle immune to rinderpest or dogs immune to rabies. A brief paper by Brooksbank & Austwick on an observation in the field is the sole basis for the statements (pp. 121 and 122) "these highly significant differences between strains (of fowls) show clearly that genes influence resistance and susceptibility to infection with *Aspergillus fumigatus*"; and: "this extends the range of pathogenic organisms affecting domestic animals to which genetic susceptibility has been demonstrated". Hutt reads far more into this paper than the authors intended and in so doing could mislead any of his readers who do not check his conclusions by consulting the original paper.

In spite of these defects the book will interest many but the reader will be well advised not to accept the many dogmatic statements about disease without due reserve. It is hardly recommended reading for students in veterinary colleges but it can scarcely fail to stimulate thinking by teachers, public health officials and advisory officers.

NICHOLS, J. E. [Milford Professor of Agriculture (Animal Husbandry), University College of Wales.] (1957). **Livestock improvement in relation to heredity and environment.** pp. xi + 240. Edinburgh (& London): Oliver & Boyd. 4th Edit. 16s. **3810**

The fourth edition of this book differs from previous editions by alterations, of a minor nature, in the text, the addition of new references to the bibliography, and the inclusion of a supplementary chapter, entitled "Review". This chapter, 29 pages long, summarizes recent developments in ideas and techniques in the improvement of domestic animals. These developments include the study of the interaction of genes within a population, the problem of deleterious genes, such as dwarfism, in many breeds of cattle, the low and high heritability of desirable characters, the methods of estimating the breeding value of an animal, and the effect of environment on individual performance and on the development of a breed.—M.G.G.

GOERTTLER, V. (1958). R. v. Ostertag. **Lehrbuch für Fleischbeschauer. [Ostertag's textbook for meat inspectors.]** pp. viii + 311. Berlin (& Hamburg): Paul Parey. 27th Edit. DM 35.80. **3811**

The multiplicity of German books on meat inspection published during the past few years causes some confusion to the uninitiated, so it

may be helpful to sort them out. On the one hand there is the standard textbook of Ostertag, of which the second edition was edited by Schönberg [*V.B.* 26, 1084], and that of Lerche, Goerttler & Rievel [*V.B.* 28, 968] which covers the whole field of food inspection. On the other hand are the more concise and more practical guides of Schönberg & Zietzschmann [*V.B.* 28, 967] and the present volume. In a class of its own is the book on abattoirs by Wagemann & Keller (1958). While the book of Schönberg & Zietzschmann is intended for the veterinary meat inspector and concentrates on applied and pathological anatomy, the present volume is designed specifically for the lay meat inspector, and constitutes an elementary course on meat inspection, with the usual attention to German legislation. The subject matter is divided into sections on the scientific basis and the legal basis of meat inspection, and the performance of ante-mortem and post-mortem inspection. There are 108 illustrations. This book has undergone an extensive evolution since the first edition of

1903, and it appears to provide a comprehensive course of instruction.—R.M.

WAGEMANN, H. & KELLER, H. (1958). *Lehrbuch der Schlachthofkunde. Aufgaben, Bau und Technik, Betriebs- und Verwaltungslehre der Schlachthöfe. [Textbook of abattoirs, their functions, construction, technology and administration.]* pp. vii+384. Berlin (& Hamburg): Paul Parey. DM 46. **3812**

This book is a comprehensive account of every aspect of the modern, well-equipped abattoir. It describes the design and equipment of each section of the abattoir, from the market hall to the sewage plant, and is illustrated by over 100 photographs and drawings. The cooling installation in particular is described in great detail. Different designs of abattoir are compared, and the administrative, financial, and legal aspects are reviewed. Examples are given of the statutes observed by abattoirs in Germany. There is an index and a bibliography of 475 references.—M.G.G.

#### BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review.]

BONADONNA, T. (1957). *Nozioni di fisiopatologia della riproduzione e di fecondazione artificiale degli animali domestici. [Physiopathology of reproduction and of artificial insemination in domestic animals.]* pp. 1659. Milan: Collana Tecnico-Scientifica "L. Spallanzani" L. 12.000. [2 vols.]

HARRISON, R. G. (Edited by) (1958). *Studies on fertility. Including papers read at the Conference of the Society for the Study of Fertility, Exeter 1957, being Vol. IX of the Proceedings of the Society.* pp. x+169. Oxford: Blackwell Scientific Publications. 25s.

MALI, L. (1958). *Maatalouden sanakirja. [Agricultural dictionary.]* pp. xxvii+595. Helsinki: Kustannusosakeyhtiö Otava. [Compiled under the auspices of the Scientific Agricultural Society of Finland.] [In Finnish, Swedish, German and English.]

SEIDEN, R. & PFANDER, W. H. (1957). *The handbook of feedstuffs. Production, formulation, medication.* pp. xii+591. New York: Springer Publishing Company, Inc. \$8.00.

VILLEE, C. A. (1958). *Gestation. Transactions of the Fourth Conference, March 5, 6 and 7, 1957, Princeton, N.J.* [Sponsored by the Josiah Macy, Jr. Foundation.] pp. 216. New York: Josiah Macy, Jr. Foundation. \$4.50.

WELCH, H. & MARTI-IBÁÑEZ, F. (Edited by) (1958). *Antibiotics annual 1957-1958.* pp. xvii+1070. New York: Medical Encyclopedia, Inc. \$12.00.

WILLIS, R. A. (1958). *The borderland of embryology and pathology.* pp. ix+627. London: Butterworth & Co. 90s.

— (1958). *British national formulary 1957. First amendment 1958.* pp. 11. London: Pharmaceutical Press. 8d.

— (1958). *Bericht des 2. Kongresses der Deutschen Veterinärmedizinischen Gesellschaft, Bad Nauheim 6./7. April, 1957. [Proceedings of the 2nd Congress of the German Veterinary Medical Association, Bad Nauheim, April 1957.]* pp. 107. Berlin (& Hamburg): Paul Parey. DM 18.



# CONTENTS

	<i>Page</i>
Diseases Caused by Bacteria and Fungi ... ..	685
Diseases Caused by Protozoan Parasites ... ..	703
Diseases Caused by Viruses and Rickettsia ... ..	709
Immunity ... ..	716
Parasites in Relation to Disease [General] ... ..	718
Parasites in Relation to Disease [Arthropods] ... ..	719
Parasites in Relation to Disease [Helminths] ... ..	723
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis] ... ..	727
Nutritional and Metabolic Disorders ... ..	728
Diseases, General ... ..	731
Poisons and Poisoning ... ..	735
Pharmacology and General Therapeutics ... ..	737
Physiology Anatomy and Biochemistry ... ..	738
Public Health, Veterinary Services and Veterinary Education ... ..	742
Reproduction and Reproductive Disorders ... ..	743
Zootechny ... ..	746
Technique and Apparatus ... ..	747
Book Reviews ... ..	747
Books Received ... ..	750

# INDEX TO AUTHORS

- Abonyi, L., 4091.  
Abramov, I. W., 3915.  
Ackermann, W. W., 3979.  
Accone, P., 3857.  
Adams, C. E., 4136.  
Adler, H. E., 3906.  
Aeschlimann, A., 4005.  
Ageev, I. Y., 3904.  
Aitken, R. N. C., 4116.  
Aivazyan, A. A., 4014.  
Akopyan, V. D., 4014.  
Alosi, C., 3826, 3839.  
Alton, G. G., 3868.  
Andersen, A. C., 4078, 4081.  
Anderson, C., 4104.  
Anderson, W. A., 4039.  
Asboe-Hansen, G., 4137.  
Ashton, G. C., 3984.  
Atherton, D. R., 4079.  
Austin, W. C., 4097.  
Awad, F. I., 3902.
- Backhausz, R., 3889.  
Bailey, W. S., 4037.  
Balbierz, H., 4070.  
Baldelli, B., 3946.  
Bamberger, K., 3947.  
Baranowska, J., 4156.  
Bard, J. W., 4102.  
Bárdos, V., 3952.  
Barger, J. D., 3898.  
Barnes, G. M., 4075.  
Barnes, E. M., 4129.  
Bauer, H., 3896.  
Becze, J., 4011.  
Beeson, P. B., 3854.  
Belding, R. C., 3860.  
Bell, F. R., 4115.  
De Bella, G., 4110.  
Belsito, A. A., 4102.  
Biondi, E., 3826.  
Bishop, A., 3928.  
Black, A. L., 4058.  
Blincoe, C., 4106.  
Blum, J., 3862.  
Böhm, L. K., 3993.  
Boehnke, M., 4119.  
Boeckman, B. B., 4103.  
Börnfors, S., 3966.  
Böszörményi, J., 3982.  
Bonadonna, T., 4131.  
Bommel, P. H., 4157.  
Bosella, A.-W. A., 4137.  
Borg-Petersen, C., 3881.  
Botti, L., 4013, 4034.  
Bracken, E. C., 3956.  
Bradley, C. A., page 750.  
Brausil, B., 4085.  
Bridges, R. G., 4095.  
Brown, R. D., 3957, 3958.  
Bruce, W. N., 3998.  
Bryant, F. J., 4082.  
Bugyaki, L., 3961.  
Burke, J. F., 3983.  
Burrows, R. B., 4022.  
Burtner, R. H., Jr., 3917.  
Bustad, L. K., 4075.  
Bystriky, V., 3948.
- Calaprice, A., 3971, 3822, 3856, 3857.  
Cardassis, J., 3933.  
Carlisle, H. N., 3900.  
Carter, B. G., 3983.  
Carter, G. R., 3849.  
Casarett, G. W., 4080.  
Castrucci, G., 3945.  
Cello, R. M., 4041.  
Cerný, V., 3932.  
Chalmers, J. G., 4086.  
Chamberlain, A. C., 4082.  
Chandler, A. C., 3911.  
Chen, J. Y. P., 4102.  
Cherry, N. H., 4119.  
Cheyroux, M., 3968.  
De China, T., 3822.  
Chioldi, V., 4166.  
Christofinis, G. J., 3977.  
Chu Shan Cheng, 4105.  
Cilli, V., 3948.  
Cinader, B., 3983.  
Claffin, R. M., 3959.  
Clark, G. W., 3921.  
Clark, I., 4055.  
Clarke, W. J., 4075.  
Clegg, M. T., 4121.  
Coghlan, J. D., 3852.
- Cohen, D., 3951.  
Common, R. H., 4147.  
Conley, J., 4080.  
Contini, A., 3896, 3905.  
Cook, M. K., 3936, 3937.  
Cooper, D. M., 4135.  
Corvazier, R., 3968.  
Councill, F., 4051.  
Cranston, E. M., 4100.  
Craveri, R., 4101.  
Csillik, B., 4087.
- Dalmat, H. T., 3970.  
Das, M. S., 3850.  
Davies, S. F. M., 3925, 3929.  
Davis, C. L., 4039.  
Dawson, R. M. C., 4134.  
Decker, G. C., 3998.  
Dedić, K., 3841, 3998.  
Delak, M., 4002.  
Delaplane, J. P., 4072.  
Dietz, O., 4065.  
Donovan, G. A., 4053.  
Drescher, J., 3980.  
Driver, F. C., 3861.  
Drudge, J. H., 4025.  
Drury, A. R., 3891.  
DuBose, R. T., 4072.  
Duchon, T., 3872, 3873, 3874, 3876, 3877.  
Durfée, W. K., 4099.
- Elam, G. W., 4025.  
Emdin, R., 4013.  
Emro, J., 4023.  
England, D. C., 4010.  
Erne, K., 4090.  
Ernek, E., 3949, 3950.
- Fantl, P., 4113.  
Farr, M. M., 3916.  
Fennestad, K. L., 3881.  
Ferenčík, M., 3872, 3873, 3874, 3875, 3876, 3877.  
Filotto, U., 4122.  
Fisher, M. W., 3905.  
Flamm, H., 3842.  
Flesher, A. M., 4073.  
Flowers, A. I., 4072.  
Ford, E. J. H., 3834, 4117.  
Fordtran, J. S., 3903.  
Forgács, B., 3901.  
Fracasso, B., 3863.  
Francis, G. E., 3989.  
Fraps, R. M., 4147.  
Fras, A., 3858.  
Freedman, D. G., 4154.  
Freedman, L. R., 3854.  
Freeman, B. A., 3860.
- Gale, C., 3848.  
Gale, D., 3825.  
Gallian, M. J., 3892.  
Galton, M. M., 3885.  
Galysh, F. T., 3823.  
Gamčík, P., 3960.  
Ganong, W. F., 4121.  
Gargani, G., 3869.  
Gáspár, Z. N., 4054.  
Geleta, J. N., 3941.  
Geoffroy, R., 4055.  
George, L. A., 4075.  
Gerber, W., 3955.  
Gerende, J. E., 3951.  
Gerhardt, P., 3879.  
Gershon-Cohen, J., 4119.  
Gibson, T. E., 4029.  
Ginsberg, A., 4018.  
Giollitti, G., 4101.  
Girard, O., 3968.  
Del Giudice, V., 4086.  
Gmitter, J., 3867.  
Goldwasser, R. A., 3944.  
Goller, H., 4124.  
Goodchild, C. G., 4015, 4016.  
Gordon, H. McL., 4024.  
Goret, P., 3831.  
Graham, O. H., 3997.  
Green, H. F., 4067.  
Greenberg, S. M., 4057.  
Greenland, R. M., 3969.  
Greenwood, D. A., 4059.  
Grigoryan, G. A., 4014.  
Grumbles, L. C., 4072.  
Gruner, J., 4065.  
Guarini, G., 3954.  
Güralp, N., 3926, 4035.
- Gustafson, D. P., 3959.  
Guze, L. B., 3854.
- Hackett, P. L., 4075.  
Hafez, E. S. E., 4145.  
Hajdu, S., 3865, 3963.  
Halasa, M., 3930.  
Haley, T. J., 4073.  
Hamdy, A. H., 3848.  
Hammel, H. T., 4109.  
Hammond, D. M., 3921.  
Hardy, J. D., 4109.  
Harley, J. M. B., 4000.  
Harris, L. E., 4059.  
Hart, P. D. A., 3833.  
Hartree, E. F., 4132.  
Hartwig, H., 3846.  
Harwin, R., 3978.  
Hatch, C., 3996.  
Hatten, B. E., 3963.  
Hawking, F., 3914.  
Hawkins, G. M., 4050.  
Hawkins, J. D., 3989.  
Hayashi, J. A., 3986.  
Henderson, B. J., 4080.  
Hengl, R., 3880.  
Henneberg, G., 3980.  
Herndon, J. F., 4057.  
Hilliger, H.-G., 4138.  
Hitchner, S. B., 3973.  
Holbrook, A. A., 3941.  
Horava, A., 4077.  
Horstman, V. G., 4075.  
Horton-Smith, C., 3920.  
Horvath, I., 3889.  
Howarth, J. A., 3884.  
Hugenholtz, P. G., 3898.
- Ichihara, A., 4088.  
Ilés, J., 3931.  
Ingram, P. L., 4050.  
Irwin, M. R., 3986.
- Jack, A., 3825.  
Jacobs, L., 3936, 3937.  
Jaffe, W. P., 4049.  
Jagger, J., 4084.  
Jakubowski, S., 3817.  
Johnson, A. E., 3921.  
Johnson, A. M., 4060.  
Johnson, B. C., 4052.  
Johnson, D. W., 4023.  
Johnson, H. D., 4105.  
Johnson, W. T., 3994.  
Jones, L. M., 3865.  
Jones, T. C., 4040.  
Joubert, L., 3831, 3837.  
Jowsey, J., 4083.  
Joyce, C. R. B., 4111.  
Joyner, L. P., 3924, 3929.  
Jungherr, E. L., page 750.
- Kaji, T., 3975.  
Kalojanoff, A. I., 4130.  
Kapp, P., 3970.  
Karl, H., 4126.  
Karulin, B. E., 3981.  
Kasza, L., 3880.  
Kawakami, Y., 3975.  
Kechawarz, M. N., 4153.  
Keeble, S. A., 3977.  
Keller, N., 4079.  
Kemeneš, F., 3880.  
Kendall, S. B., 3929.  
Kennedy, P. O., 4041.  
Keynes, R., 4104.  
Khanbegyan, R. A., 4014.  
Kilgemiagi, U., 4009, 4010.  
King, N. B., 3848.  
Kissling, R. E., 3942, 3944, 3951.  
Kleiber, M., 4059.  
Klosterman, E. W., 3848.  
De Kock, G., 3934.  
Kohn, H. I., 4081.  
Komesu, N., 4073.  
Konyukhova, V. A., 4114.  
Kopell, Z., 4062.  
Kornberg, H. A., 4075.  
Kovács, J., 4091.  
Krauss, H., 4123.  
Kraybill, H. F., 4044.  
Kréméry, V., 3872, 3873, 3874, 3875, 3876, 3877.  
Kryukova, I. N., 4042.  
Kurtz, H., 3979.  
Kvasnitskii, A. V., 4114.
- Lannek, N., 3966.  
Larson, C. L., 3836.  
Layne, D. S., 4147.  
Lei, G. M., 3890.  
Lehky, F., 3883.  
Leland, S. E., Jr., 4025.  
Lenihan, J. M. A., 4086.  
Lennette, E. H., 3953.  
Lesser, E., 3927.  
Lewis, C. N., 4103.  
Link, C. P., 3986.  
Linkfield, R. L., 4012.  
Lipanowicz, J., 3824.  
Liplich, L., 3932.  
List, R., 3836.  
Littlejohn, A., 4064.  
Van Loon, E. J., 4057.  
Lovell, H. R., 3816.  
Lucas, J. M. S., 3922.  
Ludvik, J., 3938.  
Luginbühl, H., 4160.  
Lund, E. E., 3917, 3918, 4032.  
Luther, H. G., 4053.
- McClelland, G. A. H., 4002.  
McClelland, R. B., 4043.  
McDaniel, G. R., 4142.  
McDonald, N. R., 3882.  
McGeady, P. A., 4046.  
McGuire, W. C., 3919.  
Mackenzie, C. P., 3910.  
McLaren, A., 4140.  
McLoughlin, D. K., 3916.  
Maddy, K. T., 3897, 3898.  
Madeski, Z., 4093.  
Madsen, M. A., 4059.  
Magnez, J. M., 4036.  
Malek, E. A., 4038.  
Malherbe, H., 3978.  
Mameesh, M. S., 4052.  
Mann, T., 4132.  
Manning, M. C., 3895.  
Marks, S., 4075.  
Marr, A. G., 4113.  
Marsh, B. G., 4128.  
Marshall, J. H., 4083.  
Martinovich, P., 3819.  
Marzan, B., 4092.  
Matumoto, M., 3975.  
Maw, W. A., 4147.  
Mayer, M. L., 3860.  
Melanidi, C., 3821.  
Melville, C., 4007.  
Menges, R. W., 3885.  
Mesáros, E., 3965.  
Meyers, R. A. J., 4004.  
Meyn, G., 3823.  
Michie, D., 4140.  
Milković, L., 3853.  
Miles, A., 3893, 3894.  
Miles, E. M., 3894.  
Miller, B. F., 4071.  
Miller, W. S., 4129.  
Mills, C. F., 4088.  
Miklovich, M., 4091.  
Milunovich, M., 3918.  
Miner, M. L., 3921.  
Minlux, A. W., 4039.  
Monty, K. J., 4088.  
Mora, A., 4066.  
Morehouse, N. F., 3919.  
Morgan, A., 4082.  
Moskowitz, M., 3886.  
Moulder, J. W., 3969.  
Moussa, R. S., 3887.  
Mraz, F. R., 4060.  
Mundt, J. O., 3859.  
Mura, D., 3905.  
Murányi, F., 3855.  
Murnane, D., 4069.  
Myrvik, Q. N., 3828.
- Nakagawa, M., 3814.  
Nassal, J., 3830.  
Neff, B. J., 3953.  
Neher, G. M., 3838.  
Neitz, W. O., 3935.  
Nelson, W. O., 4152.  
Nicol, L., 3968.  
Nižnansky, F., 3867, 3872, 3873, 3874, 3875, 3876, 3877.  
Norris, K. R., 4004.  
Noyes, R. W., 4136.  
Nujdin, N. I., 4151.  
Nyiredy, I., 3815.
- Ofukany, L., 3867.



- Olitski, A. L., 3878.  
Olson, N. O., 3907, 3908, 3909.  
Omori, T., 3975.  
Ono, T., 4068.  
Oparin, P. G., 4017.  
Orlić, N., 3868.  
Osmarin, P. G., 4017.  
Ostertag, W., 4149.  
Otto, H., 4125.
- Pallaske, G., 3845.  
Parfitt, J. W., 3990.  
Parker, A., 4051.  
Patrick, H., 4060.  
Patten, B. M., 4163.  
Payne, F. E., 3979.  
Payne, L. F., 4142.  
Payne, R. W., 3838.  
Pchelkina, A. A., 3981.  
Pearce, J. H., 3983.  
Pearson, P. B., 4088.  
Pegreff, G., 3864, 3905.  
Penso, G., 3888.  
Perman, V., 4089.  
Pfander, W. H., 4161.  
Phillips, F. S., 4096.  
Phillipson, A. T., 4046.  
Phung Van Dan., 3837.  
Pierotti, P., 4013.  
Pitzschke, H., 3943.  
Platt, B. S., 4048.  
Platt, H., 3940.  
Pokorný, B., 3883.  
Polony, R., 4062.  
Ponomarenko, V. V., 4155.  
Popov, V. I., 3843.  
Potter, M. D., 4097.  
Pounden, W. D., 3848.  
Prachoff, R., 4141.  
Price, K. E., 3892.  
Pritchard, W. R., 3959.  
Prohászka, L., 3855.  
Provost, A., 3904.  
Pun, C. F., 4148.
- Quesada, A., 3856, 3857, 3971.
- Raby, C., 4157.  
Ragsdale, A. C., 4105.  
Raleigh, R. J., 4059.  
Randall, C. C., 3956.  
Rasbech, M. O., 4150.  
Ratalics, L., 3963.  
Read, M. S., 4044.  
Reculard, P., 3968.  
Reed, R. E., 3898.  
Rees, R. J. W., 3835.  
Reese, P., 3819.  
Rehfeld, C. E., 4089.  
Reid, C. S. W., 4046.  
Reid, W. M., 3992, 4012.  
Reina-Guerra, M., 3884.  
Renoux, G., 3871.  
Reynolds, W. M., 4053.  
Režek, A., 4118.  
Ribelin, W. E., 4037.  
Ribi, E., 3836.
- Rice, E. G., 4057.  
Rikimaru, M. T., 3923.  
Ristic, M., 3959.  
Rocha, H., 3854.  
Roepke, M. H., 3861.  
Rogers, H. J., 4120.  
Romváry, J., 3962.  
Roots, E., 3847, 3974.  
Rose, J., 4030.  
Rosenfeld, G., 4074.  
Rott, R., 3974.  
Roulston, W. J., 4004, 4008.  
Rowell, J. G., 4135.  
Rowland, R. E., 4083.  
Roy, J. H. B., 4050.  
Rudge, J. M., 3882.  
Rummel, A. G., 4017.
- Sacco, T., 3954.  
Saison, R., 3987.  
Sanford, J. P., 3903.  
Sanger, V. L., 3848.  
Santmyer, P. H., 4036.  
Santolucito, J. A., 4121.  
Sarapato, J., 3824.  
Saslaw, S., 3900.  
Sautter, J. H., 4089.  
Savard, K., 4144.  
Sáway, G., 4087.  
Scatozza, F., 3945.  
Schalm, O. W., 3820.  
Schermer, S., page 750.  
Schleifer, H., 4065.  
Schmidt, E. G., 4051.  
Schmitzlering, H. R., 4004.  
Schofield, B. M., 4146.  
Schultze, M. O., 4089.  
Schuntner, C. A., 4008.  
Scott, G. R., 3958.  
Sebek, Z., 3888.  
Seeliger, H. P. R., 3840.  
Segal, S. J., 4152.  
Seiden, R., 4161.  
Seigneur, J., 4075.  
Seneviratna, P., 4031.  
Senze, A., 3817.  
Shalash, M. R., 4139.  
Shanahan, G. J., 3995.  
Shanklin, M. D., 4107.  
Shapiro, N. I., 4151.  
Sharaf, A., 4145.  
Shea, G. J., 3892.  
Sheahan, M., 4099.  
Sheldon, W. H., 3896.  
Shelton, D. C., 3907, 3908, 3909.  
Shelton, G. C., 4036.  
Sherman, C. C., 4053.  
Sheltar, C. L., 3838.  
Shetlar, M. E., 3838.  
Shilliam, K. W. G., 4050.  
Shinozaki, K., 4047.  
Shively, J. N., 4076.  
Shrimpton, D. H., 4129.  
Shugar, D., 4156.  
Shultz, F. T., 4078.  
Shumard, R. F., 3923.
- Shupe, J. L., 4059.  
Sikes, D., 3839.  
Simon, J., 3819.  
Simpson, H. R., 4001.  
Simunek, J., 4019.  
Skoda, R., 3948, 3949, 3950, 3972.  
Smith, A. H., 4112.  
Smith, H., 4086.  
Smith, H. R., 3848.  
Smith, H. Williams, 3832.  
Smith, J. D., 4121.  
Smith, J. E., 3851.  
Sobiech, T., 3824.  
Soto-Figueroa, E., 3828.  
Soulsby, E. J. L., 4033.  
Spicer, G. S., 4082.  
Springer, G. F., 4162.  
Sprolwis, R. G., 4009.  
Stiles, F. C., Jr., 3861.  
Steele, J. H., 3885.  
Stephen, L. E., 3910.  
Sternberg, S. S., 4096.  
Stewart, D. F., 4024.  
Stewart, R. E., 4107.  
Stewart, T. B., 4026.  
Stone, W. H., 3986.  
Stover, B. J., 4079.  
Sturkie, P. D., 4099.  
Sugimura, K., 3975.  
Sulitzeanu, D., 3878.  
Supperer, R., 3993.  
Sussman, O., 3951.  
Svet-Moldavskaya, I. A., 3988.  
Svet-Moldavsky, G. J., 3988.  
Sweatman, G. K., 4006.  
Swenson, C. B., 3838.  
Sykes, G., page 750.  
Szabó, J., 3963.  
Szakmáry, G., 3947.  
Szováty, G., 3901.
- Tarshis, I. B., 4028.  
Taylor, E. P., 4097.  
Temesi, Z., 3963.  
Terriere, L. C., 4009, 4010.  
Tessmer, C. F., 4077.  
Thörne, H., 3813.  
Thompson, J. F., 4128.  
Thompson, P. D., 3868.  
Thurston, J. P., 3912, 3913.  
Tien-Hsi Cheng, 3999.  
Toming-Reintam, V. M., 4158.  
Torres Gost, J., 3870.  
Tóth, B. L., 4054.  
Trautman, R. J., 3898.  
Trautwein, K., 3830.  
Tromba, F. G., 4021.  
Trost, W. A., 3921.  
Tucker, R. G., 4057.  
Tugwell, R. L., 3859.  
Tuttle, L. W., 4080.  
Tzortzaki, N., 3821.
- Ueda, A., 4068.  
Ucherko, J., 4127.
- Urbányi, L., 4056.  
Urman, H. K., 3926.  
Ushijima, J., 4061.
- Vana, L. R., 3866.  
Varejka, F., 3965.  
Vegapetyan, V. G., 4014.  
Vegors, H. H., 4027.  
Verlinde, J. D., 3967.  
Versteeg, J., 3967.  
de Vesty, G., 3825.  
Veto, I., 3889.  
Vicari, G., 3888.  
Vigo, A., 4122.  
Vilée, C. A., 4167.  
Vošta, J., 3888.
- Wakelam, J. A., 4049.  
Wales, R. G., 4133.  
Walker, C. A., 4108.  
Wallace, W., 4023.  
Walton, A., 4136.  
Watson, R. H., 4069.  
Weakley, C. E., Jr., 3907.  
Weatherall, M., 4111.  
Wehr, E. E., 3916.  
Weidmann, S. M., 4120.  
Weinstein, H. I., 4103.  
Weiss, D. W., 3829.  
Wetzel, B., 4002.  
Welch, H., 4103.  
Welsh, H. H., 3953.  
Wexler, B. C., 4071.  
White, I. G., 4133.  
White, P. G., 3973.  
Wicht, W., 3836.  
Williams, M. O., 4002.  
Willis, R. A., 4164.  
Winget, C. M., 4112.  
Witt, N. F., 4044.  
Wojciechowska, S., 3985.  
Wong, P. C., 3835.  
Wood, W., 3977.  
Wood, W. B., Jr., 4063.  
Wooten, E., 4081.  
Worden, A. N., 4098.  
Wyant, Z. N., 4025.  
Wyndham, C. H., 4109.
- Yamamoto, R., 3906.  
Yashenkina, M. I., 3844.  
Yeates, N. T. M., 4143.  
Yost, D. H., 4040.  
Young, G., 3899.
- Zachariae, E., 4137.  
Zavadil, R., 3991.  
Zboril, J., 3827.  
Zeljko, M., 3858.  
Zil'ber, L. A., 4042.  
Zimmermann, W. J., 4020.  
Zolli, Z., Jr., 3892.  
Zuffa, A., 3948, 3972.  
Zumpt, F., 4003.

# ERRATA

- V.B. 28, abst. 3225. In line 3 of title translation, for "Alrara," read: Altara.  
abst. 3229. Line 6 of abst. For "form," read: from.  
abst. 3698. In penultimate line, for "larygeal," read: laryngeal.

The Executive Council of the Commonwealth Agricultural Bureaux is a signatory to the Fair Copying Declaration, details of which can be obtained from the Royal Society, Burlington House, London, W.1.

## ABBREVIATIONS OF NAMES OF PUBLICATIONS

The abbreviations used in *Index Veterinarius* and *The Veterinary Bulletin* are those of the *World List of Scientific Periodicals published in the years 1900-1950*, 3rd Edit. (1952), London: Butterworths Scientific Publications.

# **JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION**

(Established 1877)

A PRACTITIONER'S JOURNAL

ISSUED ON THE 1st AND 15th OF EACH MONTH

*Annual subscription—*

\$16.50

*Order direct from the publisher:*

American Veterinary Medical Association

600 S. Michigan Ave., Chicago 5, Ill., U.S.A.

(Orders may be sent through Baillière, Tindall & Cox, London, Eng.)

# **AMERICAN JOURNAL OF VETERINARY RESEARCH**

(Established 1940)

REPORTS OF ORIGINAL RESEARCH IN  
ANIMAL DISEASES

A BIMONTHLY . . .

ISSUED IN JANUARY, MARCH, MAY, JULY,  
SEPTEMBER, NOVEMBER

*Annual subscription—\$11.00*

*Order direct from the publisher:*

American Veterinary Medical Association

600 S. Michigan Ave., Chicago 5, Ill., U.S.A.

(Orders may be sent through Baillière, Tindall & Cox, London, Eng.)



## SOME RECENT PUBLICATIONS OF THE COMMONWEALTH BUREAU OF ANIMAL HEALTH

---

### NEOPLASMS OF THE DOMESTICATED MAMMALS

by E. COTCHIN, M.R.C.V.S., *Royal Veterinary College, London*

Crown 4to stiff cover pp.xv + 100

A comprehensive review covering mainly the period from 1932 onwards.

950 references

Price 20s.

### SALMONELLOSIS IN ANIMALS

by A. BUXTON, PhD., M.R.C.V.S., *Dept. Vety. Pathology, University of Liverpool*

Medium 8vo stiff cover pp.v + 209

A comprehensive review covering domestic animals, poultry, fur-bearing animals, rodents, reptiles and arthropods.

1,750 references

Price 25s.

### VETERINARY REVIEWS AND ANNOTATIONS

A half-yearly review of topical subjects.

Annual Subscription 25s.

All the above obtainable from:—

Central Sales Branch, COMMONWEALTH AGRICULTURAL BUREAUX, Farnham Royal,  
Nr. Slough, Bucks, England.

## Index Veterinarius

### A COMPLETE BIBLIOGRAPHY OF VETERINARY LITERATURE

This subject and author index of current literature on veterinary and related sciences is produced by the Commonwealth Bureau of Animal Health and was first published in 1933. It is issued quarterly and each year about 10,000 references are listed. Arrangement of material is designed to facilitate rapid location of information.

For compilation of the *Index* nearly a thousand periodicals in 22 languages are searched and coverage embraces the whole world.

Annual subscription is £5 and orders may be sent to the Central Sales Branch, Commonwealth Agricultural Bureaux, Farnham Royal, Slough, Bucks.

---

Volumes 13—25 (1945-1957) are still available. Stocks of other volumes are incomplete.  
Details on request.



**A**EROSOL

**C**HLOROMYCETIN

**T**INCTURE

**COLOURLESS**

*For local treatment of wounds and superficial infections in both large and small animals.  
Also as a pre- and post-operative application.*

**A**EROSOL **C**HLOROMYCETIN <sup>\*</sup>**T**INCTURE

**COLOURLESS**

- Easily applied • Convenient to use
- Economical • Stays in situ after treatment

*Available in tins containing 3 fl. oz.*



<sup>\*</sup>Trade Mark

PARKE, DAVIS & CO. LTD. (INC. U.S.A.) • HOUNSLOW • MIDDLESEX • TEL. HOUNSLOW 2361  
102J